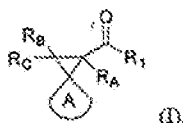


Application No.: 10/691,095  
 Amendment Date: February 2, 2010  
 Reply to Office Action of September 2, 2009

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Claim 1 (Currently Amended):** A method of treating migraine, epilepsy, or bipolar disorder in a mammal comprising administering to a mammal a therapeutically effective amount of a compound of formula (I)



or a pharmaceutically acceptable prodrug thereof, wherein

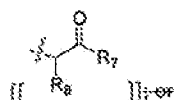
A is cyclohexyl optionally substituted with 1, 2, 3, or 4 alkyl groups cycloalkyl- or bicycloalkyl;

R<sub>A</sub>, R<sub>B</sub>, and R<sub>C</sub> are independently hydrogen or alkyl;

R<sub>1</sub> is OR<sub>2</sub> or NR<sub>3</sub>R<sub>4</sub>;

R<sub>2</sub> is hydrogen, alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, heterocycle, or heterocyclealkyl;

R<sub>3</sub> and R<sub>4</sub> are independently hydrogen, alkenyl, alkyl, alkynyl, alkoxy-carbonylalkyl, aryl, arylalkyl, carboxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycle, heterocyclealkyl, hydroxyalkyl, (NR<sub>5</sub>R<sub>6</sub>)alkyl, or (NR<sub>5</sub>R<sub>6</sub>)carbonylalkyl; or



—R<sub>3</sub> and R<sub>4</sub> taken together with the nitrogen atom to which they are attached form a heterocycle wherein the heterocycle is azepanyl, azetidinyl, aziridinyl, morpholinyl, piperazinyl, piperidinyl, pyrrolidinyl, or thiomorpholinyl; and

## Author Search

=> FILE HCAPLUS

FILE 'HCAPLUS' ENTERED AT 14:43:11 ON 28 APR 2010

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PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

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FILE COVERS 1907 - 28 Apr 2010 VOL 152 ISS 18

FILE LAST UPDATED: 27 Apr 2010 (20100427/ED)

REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2010

USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2010

HCAPLUS now includes complete International Patent Classification (IPC) reclassification data for the first quarter of 2010.

CAS Information Use Policies apply and are available at:

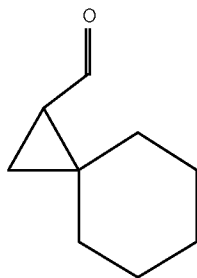
<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

'OBI' IS DEFAULT SEARCH FIELD FOR 'HCAPLUS' FILE

=> D STAT QUE L21

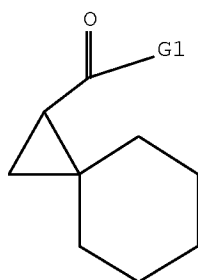
L3 STR



Structure attributes must be viewed using STN Express query preparation.

L5 709 SEA FILE=REGISTRY SSS FUL L3

L6 STR



G1 N, OH

Structure attributes must be viewed using STN Express query preparation.

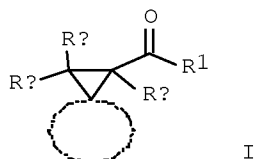
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L12	110	SEA FILE=HCAPLUS SPE=ON	ABB=ON PLU=ON	BUNNELLE W?/AU
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L14	41	SEA FILE=HCAPLUS SPE=ON	ABB=ON PLU=ON	CHEMBURKAR S?/AU
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L20	61273	SEA FILE=HCAPLUS SPE=ON	ABB=ON PLU=ON	WANG L?/AU
L21	2	SEA FILE=HCAPLUS SPE=ON	ABB=ON PLU=ON	(L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20) AND L10

=> D IBIB ED ABS HITSTR L21 1-2

L21 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2004:857165 HCAPLUS Full-text  
DOCUMENT NUMBER: 141:325759  
TITLE: Spirocyclopropyl amides and acids and their  
therapeutic applications  
INVENTOR(S): Bennani, Youseff L.; Bunnelle, William abandoned  
H.; Chang, Sou-Jen; Chemburkar,  
Sanjay R.; Chen, Jinhua; Dart,  
Michael J.; Fernando, Dilinie; Ku,  
Yi-Yin; Lockwood, Mark; Wang,  
Lei  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 27 pp.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 20040204396	A1	20041014	US 2003-691095	20031022 <--
PRIORITY APPLN. INFO.:			US 2002-420286P	P 20021022 <--

OTHER SOURCE(S): MARPAT 141:325759  
 ED Entered STN: 18 Oct 2004  
 GI



AB The present invention relates to the use of compds. I (A = cycloalkyl or bicycloalkyl; RA, RB, RC = H, alkyl; R1 = OR2, NR3R4; R2 = H, alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, heterocycle, heterocyclealkyl; R3, R4 = H, alkenyl, alkyl, etc.) for the treatment of epilepsy, bipolar disorder, psychiatric disorders, migraine, pain, or movement disorders, and to provide neuroprotection. Representative compds. exhibited anticonvulsant ED50s in the range of about 0.36 mmol/kg to about 0.20 mmol/kg using the maximal electroshock procedure with mice. Many compds. were prepared and are claimed.

IT 1055761-02-8 1055761-03-9

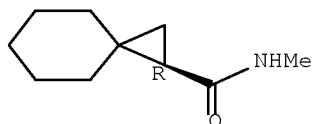
RL: PRPH (Prophetic)

(Spirocyclopropyl amides and acids and their therapeutic applications)

RN 1055761-02-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-methyl-, (1R)- (CA INDEX NAME)

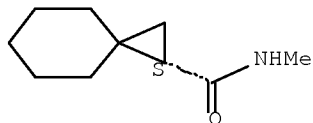
Absolute stereochemistry.



RN 1055761-03-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-methyl-, (1S)- (CA INDEX NAME)

Absolute stereochemistry.



IT 17202-86-7P, Spiro[2.5]octane-1-carboxylic acid  
 680618-92-2P, (1S)-N-((1S)-2-Amino-1-methyl-2-oxoethyl)spiro[2.5]octane-1-carboxamide 680618-93-3P,  
 (1R)-N-((1S)-2-Amino-1-methyl-2-oxoethyl)spiro[2.5]octane-1-carboxamide

Serial No.:10/691,095

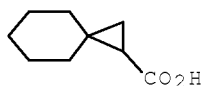
680618-94-4P 680618-96-6P 680619-02-7P,  
2-Methylspiro[2.5]octane-1-carboxylic acid 680619-04-9P,  
5,7-Dimethylspiro[2.5]octane-1-carboxylic acid 680619-06-1P,  
6-tert-Butylspiro[2.5]octane-1-carboxylic acid 680619-24-3P  
680619-41-4P, 5,5,7,7-Tetramethylspiro[2.5]octane-1-carboxylic  
acid

RL: BSU (Biological study, unclassified); PAC (Pharmacological activity);  
RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL  
(Biological study); PREP (Preparation); RACT (Reactant or reagent); USES  
(Uses)

(spirocyclopropyl amides and acids for neuroprotection and treatment of  
epilepsy, bipolar disorders, migraine,)

RN 17202-86-7 HCAPLUS

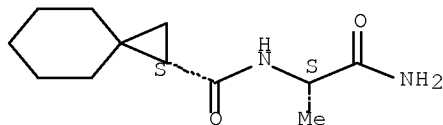
CN Spiro[2.5]octane-1-carboxylic acid (CA INDEX NAME)



RN 680618-92-2 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(1S)-2-amino-1-methyl-2-oxoethyl]-,  
(1S)- (CA INDEX NAME)

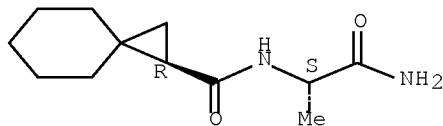
Absolute stereochemistry.



RN 680618-93-3 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(1S)-2-amino-1-methyl-2-oxoethyl]-,  
(1R)- (CA INDEX NAME)

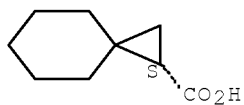
Absolute stereochemistry.



RN 680618-94-4 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, (1S)- (CA INDEX NAME)

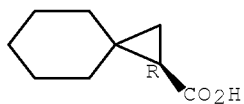
Absolute stereochemistry.



RN 680618-96-6 HCAPLUS

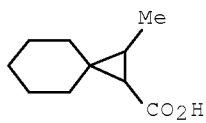
CN Spiro[2.5]octane-1-carboxylic acid, (1R)- (CA INDEX NAME)

Absolute stereochemistry.



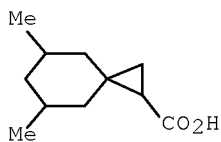
RN 680619-02-7 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2-methyl- (CA INDEX NAME)



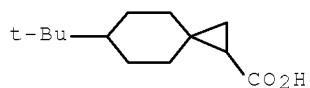
RN 680619-04-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 5,7-dimethyl- (CA INDEX NAME)



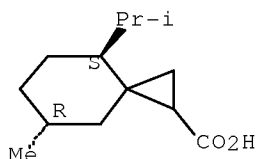
RN 680619-06-1 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 6-(1,1-dimethylethyl)- (CA INDEX NAME)

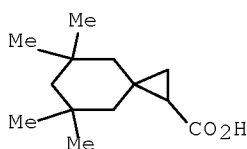


RN 680619-24-3 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 7-methyl-4-(1-methylethyl)-, (4S,7R)-  
 (CA INDEX NAME)

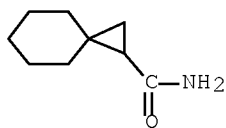
Absolute stereochemistry.



RN 680619-41-4 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 5,5,7,7-tetramethyl- (CA INDEX NAME)

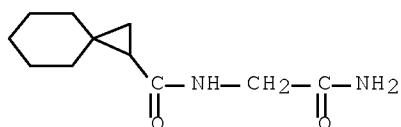


IT 17202-88-9P, Spiro[2.5]octane-1-carboxamide  
 680618-91-1P, N-(2-Amino-2-oxoethyl)spiro[2.5]octane-1-carboxamide  
 680618-95-5P, (1S)-N-(2-Amino-2-oxoethyl)spiro[2.5]octane-1-  
 carboxamide 680619-03-8P,  
 N-(2-Amino-2-oxoethyl)-2-methylspiro[2.5]octane-1-carboxamide  
 680619-05-0P, N-(2-Amino-2-oxoethyl)-5,7-dimethylspiro[2.5]octane-  
 1-carboxamide 680619-07-2P,  
 N-(2-Amino-2-oxoethyl)-6-tert-butylspiro[2.5]octane-1-carboxamide  
 680619-26-5P 680619-28-7P 680619-37-8P,  
 N-(3-Amino-3-oxopropyl)spiro[2.5]octane-1-carboxamide  
 680619-43-6P, 5,5,7,7-Tetramethylspiro[2.5]octane-1-carboxamide  
 680619-45-8P, N-(2-Amino-2-oxoethyl)-5,5,7,7-  
 tetramethylspiro[2.5]octane-1-carboxamide 680619-47-0P,  
 [(Spiro[2.5]oct-1-ylcarbonyl)amino]acetic acid 680619-54-9P,  
 (1R)-N-((2R)-2-Hydroxypropyl)spiro[2.5]octane-1-carboxamide  
 680619-55-0P, (1S)-N-((2R)-2-Hydroxypropyl)spiro[2.5]octane-1-  
 carboxamide 680619-56-1P,  
 (1R)-N-((2S)-2-Hydroxypropyl)spiro[2.5]octane-1-carboxamide  
 680619-57-2P, (1S)-N-((2S)-2-Hydroxypropyl)spiro[2.5]octane-1-  
 carboxamide  
 RL: BSU (Biological study, unclassified); PAC (Pharmacological activity);  
 SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological  
 study); PREP (Preparation); USES (Uses)  
 (spirocyclopropyl amides and acids for neuroprotection and treatment of  
 epilepsy, bipolar disorders, migraine,)  
 RN 17202-88-9 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide (CA INDEX NAME)



RN 680618-91-1 HCAPLUS

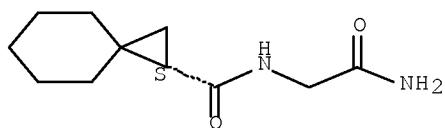
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)- (CA INDEX NAME)



RN 680618-95-5 HCAPLUS

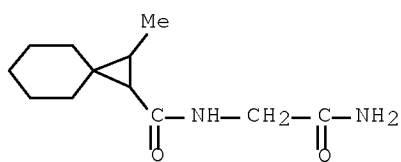
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-, (1S)- (CA INDEX NAME)

Absolute stereochemistry.



RN 680619-03-8 HCAPLUS

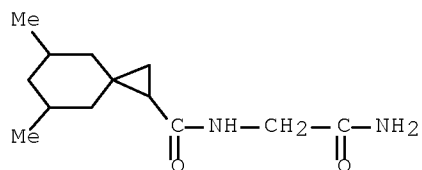
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RN 680619-05-0 HCAPLUS

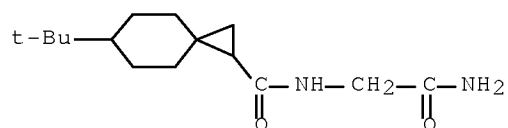
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-5,7-dimethyl- (CA INDEX NAME)





RN 680619-07-2 HCAPLUS

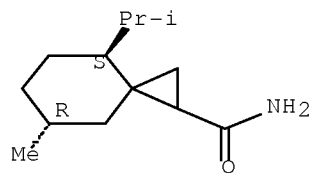
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-6-(1,1-dimethylethyl)- (CA INDEX NAME)



RN 680619-26-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 7-methyl-4-(1-methylethyl)-, (4S,7R)- (CA INDEX NAME)

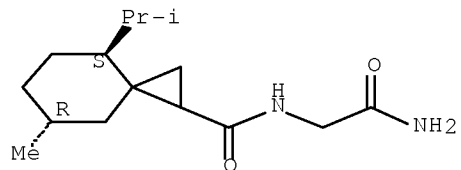
Absolute stereochemistry.



RN 680619-28-7 HCAPLUS

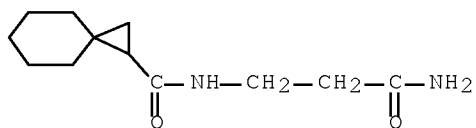
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-7-methyl-4-(1-methylethyl)-, (4S,7R)- (CA INDEX NAME)

Absolute stereochemistry.



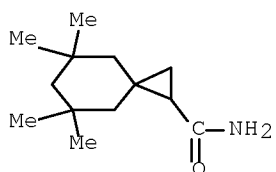
RN 680619-37-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(3-amino-3-oxopropyl)- (CA INDEX NAME)



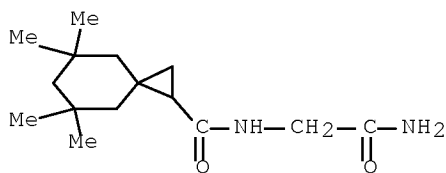
RN 680619-43-6 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 5,5,7,7-tetramethyl- (CA INDEX NAME)



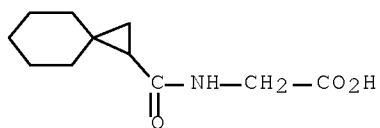
RN 680619-45-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-5,5,7,7-tetramethyl- (CA INDEX NAME)



RN 680619-47-0 HCAPLUS

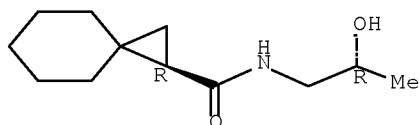
CN Glycine, N-(spiro[2.5]oct-1-ylcarbonyl)- (CA INDEX NAME)



RN 680619-54-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2R)-2-hydroxypropyl]-, (1R)- (CA INDEX NAME)

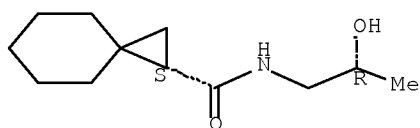
Absolute stereochemistry.



RN 680619-55-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2R)-2-hydroxypropyl]-, (1S)- (CA INDEX NAME)

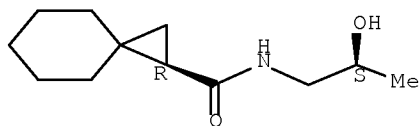
Absolute stereochemistry.



RN 680619-56-1 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2S)-2-hydroxypropyl]-, (1R)- (CA INDEX NAME)

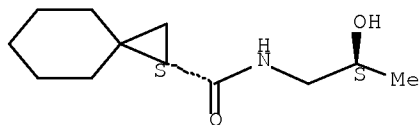
Absolute stereochemistry.



RN 680619-57-2 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2S)-2-hydroxypropyl]-, (1S)- (CA INDEX NAME)

Absolute stereochemistry.



IT 680618-97-7, (1R)-N-(2-Amino-2-oxoethyl)spiro[2.5]octane-1-carboxamide 680619-58-3 680619-59-4  
680619-60-7, 2-Methylspiro[2.5]octane-1-carboxamide

Serial No.:10/691,095

680619-61-8, 5,7-Dimethylspiro[2.5]octane-1-carboxamide

680619-62-9, 6-tert-Butylspiro[2.5]octane-1-carboxamide

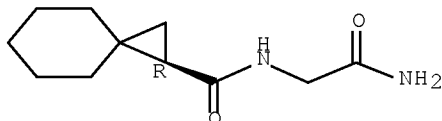
RL: BSU (Biological study, unclassified); PAC (Pharmacological activity);  
THU (Therapeutic use); BIOL (Biological study); USES (Uses)

(spirocyclopropyl amides and acids for neuroprotection and treatment of  
epilepsy, bipolar disorders, migraine,)

RN 680618-97-7 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-, (1R)- (CA INDEX  
NAME)

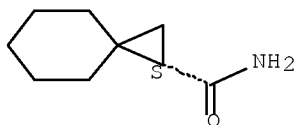
Absolute stereochemistry.



RN 680619-58-3 HCAPLUS

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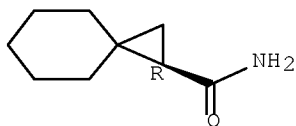
Absolute stereochemistry.



RN 680619-59-4 HCAPLUS

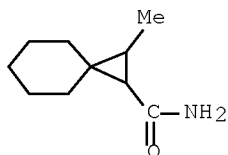
CN Spiro[2.5]octane-1-carboxamide, (1R)- (CA INDEX NAME)

Absolute stereochemistry.



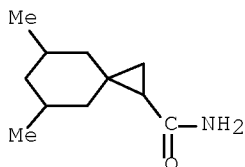
RN 680619-60-7 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 2-methyl- (CA INDEX NAME)



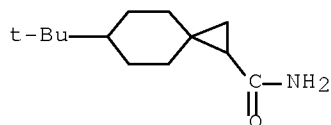
RN 680619-61-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 5,7-dimethyl- (CA INDEX NAME)



RN 680619-62-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 6-(1,1-dimethylethyl)- (CA INDEX NAME)



L21 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2004:331780 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:338974

TITLE: Preparation of spirocyclopropyl amides and acids as anticonvulsants

INVENTOR(S): Bennani, Youssef L.; Bunnelle, William H.; Chang, Sou-Jen; Chemburkar, Sanjay R.; Chen, Jinhua; Dart, Michael J.; Fernando, Dilinie P.; Ku, Yi-Yin; Lockwood, Mark; Wang, Lei

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 27 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040077616	A1	20040422	US 2002-277266	20021022 <--

Serial No.:10/691,095

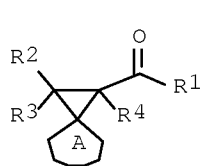
CA 2502906	A1	20040506	CA 2003-2502906	20031022 <--
WO 2004037240	A1	20040506	WO 2003-US33688	20031022 <--
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EP 1558230	A1	20050803	EP 2003-774943	20031022 <--
EP 1558230	B1	20081231		
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AT 418973	T	20090115	AT 2003-774943	20031022 <--
MX 2005004267	A	20050726	MX 2005-4267	20050421 <--
PRIORITY APPLN. INFO.:			US 2002-277266	A 20021022 <--
			WO 2003-US33688	W 20031022

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

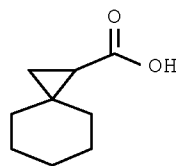
OTHER SOURCE(S): MARPAT 140:338974

ED Entered STN: 23 Apr 2004

GI



I



II

AB Title compds. I [A = cycloalkyl, bicycloalkyl; R2-4 = H, alkyl; R1 = alkoxy, amino] are prepared For instance, methylenecyclohexane is treated with Et diazoacetate (methylcyclohexane, Cu, 100-105°) and the resulting ester saponified to give II. Representative examples of I exhibit ED50 = 0.84 - 0.35 mmol/kg in the s.c. pentylenetetrazole (PTZ) seizure model. I are useful in the treatment of epilepsy, bipolar disorder, psychiatric disorders, migraine, pain, or movement disorders, and to provide neuroprotection.

IT 1055761-02-8 1055761-03-9

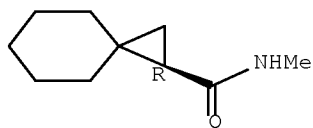
RL: PRPH (Prophetic)

(Preparation of spirocyclopropyl amides and acids as anticonvulsants)

RN 1055761-02-8 HCAPLUS

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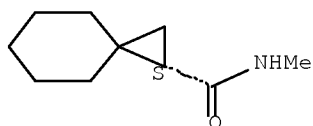
Absolute stereochemistry.



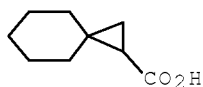
RN 1055761-03-9 HCAPLUS

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Absolute stereochemistry.

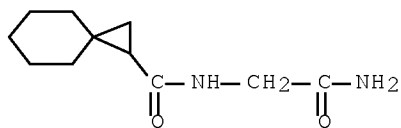


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 680618-92-2P, (1S)-N-((1S)-2-Amino-1-methyl-2-oxoethyl)spiro[2.5]octane-1-carboxamide 680618-93-3P,  
 (1R)-N-((1S)-2-Amino-1-methyl-2-oxoethyl)spiro[2.5]octane-1-carboxamide  
 680618-94-4P, (S)-Spiro[2.5]octane-1-carboxylic acid  
 680618-96-6P, (R)-Spiro[2.5]octane-1-carboxylic acid  
 680619-02-7P, 2-Methylspiro[2.5]octane-1-carboxylic acid  
 680619-04-9P, 5,7-Dimethylspiro[2.5]octane-1-carboxylic acid  
 680619-06-1P, 6-tert-Butylspiro[2.5]octane-1-carboxylic acid  
 680619-24-3P 680619-41-4P,  
 5,5,7,7-Tetramethylspiro[2.5]octane-1-carboxylic acid  
 RL: PAC (Pharmacological activity); RCT (Reactant); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
 (preparation of spirocyclopropyl amides and acids as anticonvulsants)  
 RN 17202-86-7 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid (CA INDEX NAME)



RN 680618-91-1 HCAPLUS

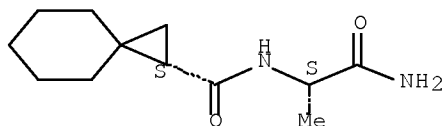
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)- (CA INDEX NAME)



RN 680618-92-2 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(1S)-2-amino-1-methyl-2-oxoethyl]-, (1S)- (CA INDEX NAME)

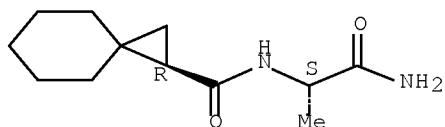
Absolute stereochemistry.



RN 680618-93-3 HCAPLUS

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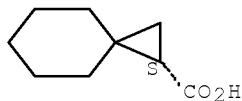
Absolute stereochemistry.



RN 680618-94-4 HCAPLUS

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Absolute stereochemistry.

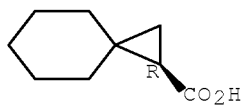


RN 680618-96-6 HCAPLUS

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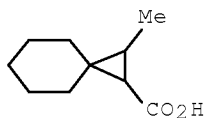
Absolute stereochemistry.





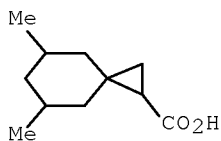
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CN Spiro[2.5]octane-1-carboxylic acid, 2-methyl- (CA INDEX NAME)



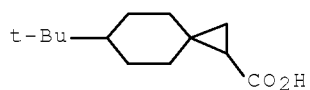
RN 680619-04-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 5,7-dimethyl- (CA INDEX NAME)



RN 680619-06-1 HCAPLUS

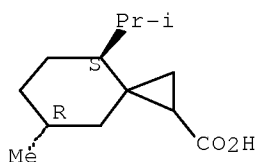
CN Spiro[2.5]octane-1-carboxylic acid, 6-(1,1-dimethylethyl)- (CA INDEX NAME)



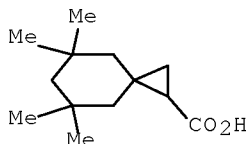
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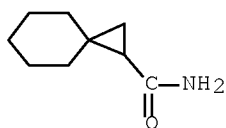
Absolute stereochemistry.



RN 680619-41-4 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 5,5,7,7-tetramethyl- (CA INDEX NAME)



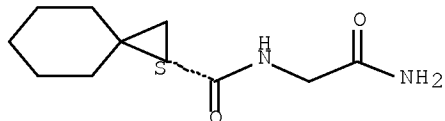
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 (1R)-N-(2-Amino-2-oxoethyl)spiro[2.5]octane-1-carboxamide  
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 680619-07-2P, N-(2-Amino-2-oxoethyl)-6-tert-butylspiro[2.5]octane-1-carboxamide 680619-26-5P 680619-28-7P  
 680619-37-8P, N-(3-Amino-3-oxopropyl)spiro[2.5]octane-1-carboxamide 680619-43-6P,  
 5,5,7,7-Tetramethylspiro[2.5]octane-1-carboxamide 680619-45-8P  
 , N-(2-Amino-2-oxoethyl)-5,5,7,7-tetramethylspiro[2.5]octane-1-carboxamide  
 680619-47-0P, [(Spiro[2.5]oct-1-ylcarbonyl)amino]acetic acid  
 680619-49-2P, (S)-[[Spiro[2.5]oct-1-ylcarbonyl]amino]acetic acid  
 680619-51-6P, (R)-[[Spiro[2.5]oct-1-ylcarbonyl]amino]acetic acid  
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 680619-59-4P, (R)-Spiro[2.5]octane-1-carboxamide  
 680619-60-7P, 2-Methylspiro[2.5]octane-1-carboxamide  
 680619-61-8P, 5,7-Dimethylspiro[2.5]octane-1-carboxamide  
 680619-62-9P, 6-tert-Butylspiro[2.5]octane-1-carboxamide  
 RL: PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
 (preparation of spirocyclopropyl amides and acids as anticonvulsants)  
 RN 17202-88-9 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide (CA INDEX NAME)



RN 680618-95-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-, (1S)- (CA INDEX NAME)

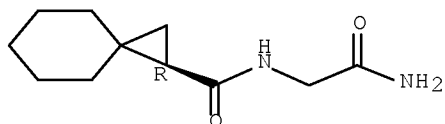
Absolute stereochemistry.



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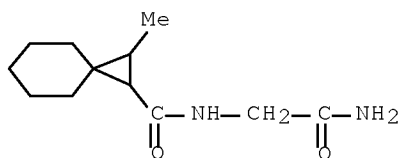
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Absolute stereochemistry.



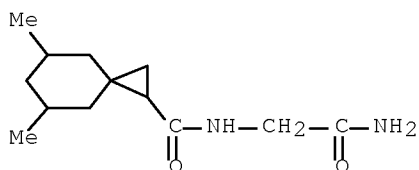
RN 680619-03-8 HCAPLUS

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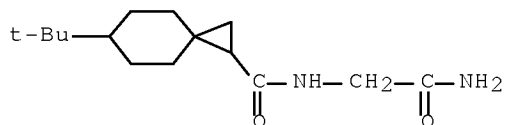
RN 680619-05-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-5,7-dimethyl- (CA INDEX NAME)



RN 680619-07-2 HCAPLUS

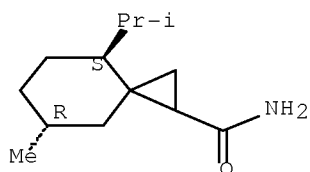
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-6-(1,1-dimethylethyl)- (CA INDEX NAME)



RN 680619-26-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 7-methyl-4-(1-methylethyl)-, (4S,7R)- (CA INDEX NAME)

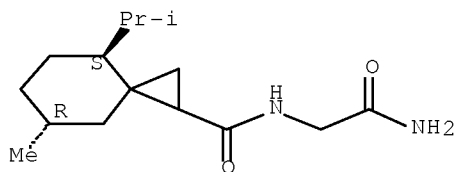
Absolute stereochemistry.



RN 680619-28-7 HCAPLUS

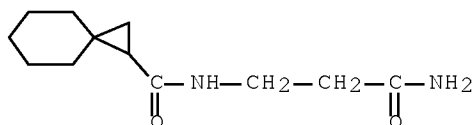
CN Spiro[2.5]octane-1-carboxamide, N-(2-amino-2-oxoethyl)-7-methyl-4-(1-methylethyl)-, (4S,7R)- (CA INDEX NAME)

Absolute stereochemistry.



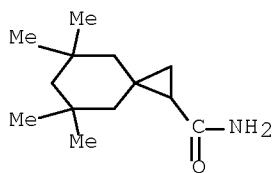
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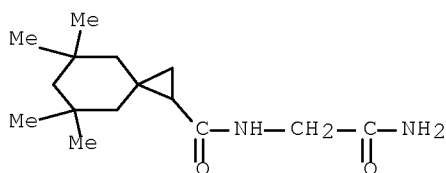
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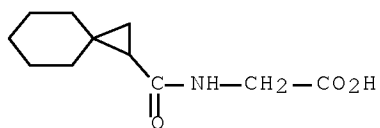
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RN 680619-47-0 HCAPLUS

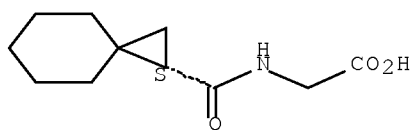
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RN 680619-49-2 HCAPLUS

CN Glycine, N-[(1S)-spiro[2.5]oct-1-ylcarbonyl]- (CA INDEX NAME)

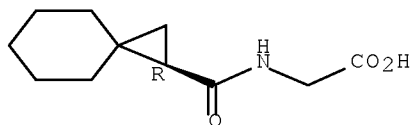
Absolute stereochemistry.



RN 680619-51-6 HCAPLUS

CN Glycine, N-[(1R)-spiro[2.5]oct-1-ylcarbonyl]- (CA INDEX NAME)

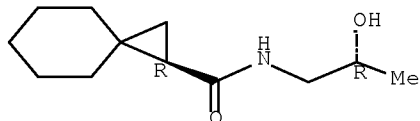
Absolute stereochemistry.



RN 680619-54-9 HCAPLUS

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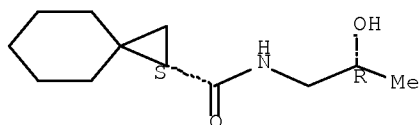
Absolute stereochemistry.



RN 680619-55-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2R)-2-hydroxypropyl]-, (1S)- (CA INDEX NAME)

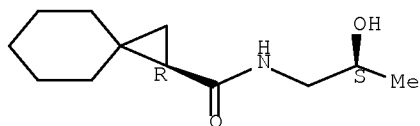
Absolute stereochemistry.



RN 680619-56-1 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2S)-2-hydroxypropyl]-, (1R)- (CA INDEX NAME)

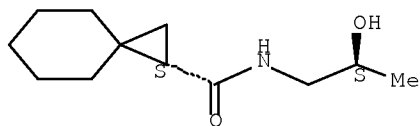
Absolute stereochemistry.



RN 680619-57-2 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-[(2S)-2-hydroxypropyl]-, (1S)- (CA INDEX NAME)

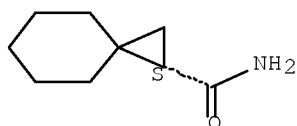
Absolute stereochemistry.



RN 680619-58-3 HCAPLUS

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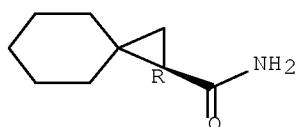
Absolute stereochemistry.



RN 680619-59-4 HCAPLUS

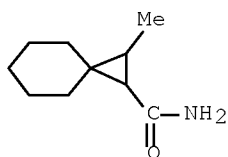
CN Spiro[2.5]octane-1-carboxamide, (1R)- (CA INDEX NAME)

Absolute stereochemistry.



RN 680619-60-7 HCAPLUS

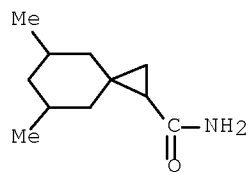
CN Spiro[2.5]octane-1-carboxamide, 2-methyl- (CA INDEX NAME)



Serial No.:10/691,095

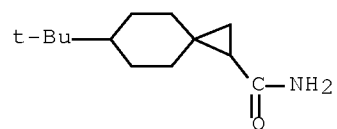
RN 680619-61-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 5,7-dimethyl- (CA INDEX NAME)



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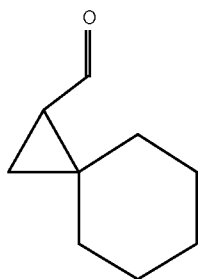
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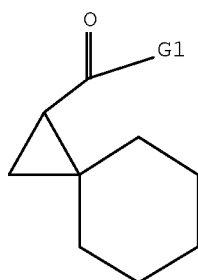
# Structure Search

=> D STAT QUE L23  
L3 STR



Structure attributes must be viewed using STN Express query preparation.

L5 709 SEA FILE=REGISTRY SSS FUL L3  
L6 STR



G1 N, OH

Structure attributes must be viewed using STN Express query preparation.

L8 129 SEA FILE=REGISTRY SUB=L5 SSS FUL L6  
L9 53 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8  
L10 41 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L9 AND (PRY<=2002 OR  
AY<=2002 OR PD<=2002 OR PY<=2002)  
L22 132635 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON "MENTAL AND BEHAVIORAL  
DISORDERS"+OLD,NT/CT OR MIGRAINE+OLD,NT/CT OR EPILEPSY+OLD,NT/  
CT  
L23 3 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L10 AND L22

=> S L23 NOT L21  
L24 1 L23 NOT L21

=> D IBIB ED ABS HITSTR L24 1

L24 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2004:467697 HCAPLUS Full-text Bad date\*  
DOCUMENT NUMBER: 141:38623  
TITLE: A preparation of fused bicyclic nitrogen-containing  
heterocycles, useful in the treatment or prevention of

# Serial No.:10/691,095

metabolic and cell proliferative diseases

INVENTOR(S): Fox, Brian M.; Furukawa, Noboru; Hao, Xiaolin; Iio, Kiyosei; Inaba, Takashi; Jackson, Simon M.; Kayser, Frank; Labelle, Marc; Li, Kexue; Matsui, Takuya; McMinn, Dustin L.; Ogawa, Nobuya; Rubenstein, Steven M.; Sagawa, Shoichi; Sugimoto, Kazuyuki; Suzuki, Masahiro; Tanaka, Masahiro; Ye, Guosen; Yoshida, Atsuhito; Zhang, Jian

PATENT ASSIGNEE(S): Tularik Inc., USA; Japan Tobacco, Inc.

SOURCE: PCT Int. Appl., 176 pp.  
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004047755	A2	20040610	WO 2003-US37574	20031121 <--
WO 2004047755	A3	20041125		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2514473	A1	20040610	CA 2003-2514473	20031121 <--
CA 2514473	C	20080527		
AU 2003293006	A1	20040618	AU 2003-293006	20031121 <--
US 20040209871	A1	20041021	US 2003-720844	20031121 <--
US 7244727	B2	20070717		
EP 1562956	A2	20050817	EP 2003-789996	20031121 <--
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
BR 2003015688	A	20050906	BR 2003-15688	20031121 <--
JP 2006509764	T	20060323	JP 2004-555693	20031121 <--
JP 3988830	B2	20071010		
CN 1753897	A	20060329	CN 2003-80109107	20031121 <--
NZ 539952	A	20080530	NZ 2003-539952	20031121 <--
RU 2342388	C2	20081227	RU 2005-119646	20031121 <--
ZA 2005003823	A	20060222	ZA 2005-3823	20050512 <--
KR 772297	B1	20071102	KR 2005-709128	20050520 <--
IN 2005DN02477	A	20070126	IN 2005-DN2477	20050609 <--
NO 2005002923	A	20050818	NO 2005-2923	20050615 <--
US 20070244096	A1	20071018	US 2007-743376	20070502 <--
PRIORITY APPLN. INFO.:			US 2002-428600P	P 20021122 <--
			US 2003-720844	A3 20031121
			WO 2003-US37574	W 20031121

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 141:38623

ED Entered STN: 10 Jun 2004

GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The invention relates to fused bicyclic nitrogen-containing heterocycles of formula I [wherein: X is C(R6) or N; Y is C(R6)1-2, N(R6)0-1; Z is O or S; W1 and W2 are independently selected from (un)substituted (hetero)cycloalkyl or (hetero)aryl; L1 and L2 are independently selected from bond, alkylene, or alkenylene, etc.; R1, R2, R3, and R4 are independently selected from H, alk(en/yn)yl, CHO, or C(O)-alkyl, etc.; R3 and R4 may be combined with the nitrogen to form a 5-, 6-, or 7-membered rings; R5 is H, (halo)alkyl, alk(en/yn)yl, OH, or alkoxy, etc.; R6 is H, alk(en/yn)yl, fluoroalkyl, or aryl, etc.], useful in the treatment or prevention of metabolic and cell proliferative diseases. The invention provides compds. which modulate the activity of proteins involved in lipid metabolism and cell proliferation. For instance, pyrimidine derivative II (hDGAT1 IC50 < 0.01  $\mu$ M) was prepared via heterocyclization of 4,5-diamino-6-hydroxypyrimidine and bromoketone III (example 2, no yield data).

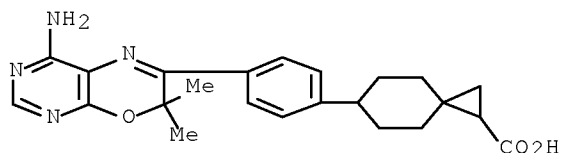
IT 701236-48-8F

RL: PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

(preparation of fused bicyclic nitrogen-containing heterocycles, useful in the treatment or prevention of metabolic and cell proliferative diseases)

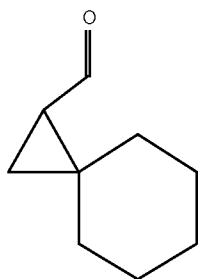
RN 701236-48-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid,  
6-[4-(4-amino-7,7-dimethyl-7H-pyrimido[4,5-b][1,4]oxazin-6-yl)phenyl]-  
(CA INDEX NAME)



OS.CITING REF COUNT: 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (21 CITINGS)

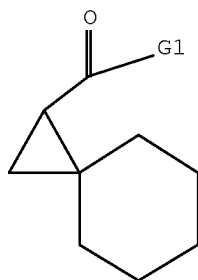
=> D STAT QUE L10  
L3 STR



Structure attributes must be viewed using STN Express query preparation.

L5 709 SEA FILE=REGISTRY SSS FUL L3

L6 STR



G1 N, OH

Structure attributes must be viewed using STN Express query preparation.

L8 129 SEA FILE=REGISTRY SUB=L5 SSS FUL L6

L9 53 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L8

L10 41 SEA FILE=HCAPLUS SPE=ON ABB=ON PLU=ON L9 AND (PRY<=2002 OR  
AY<=2002 OR PD<=2002 OR PY<=2002)

=> S L10 NOT L21, L23

L25 38 L10 NOT (L21 OR L23)

=> D IBIB ED ABS HITSTR 1-38

L25 ANSWER 1 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2008:1383602 HCAPLUS Full-text

DOCUMENT NUMBER: 149:555106

TITLE: Intermolecular metal-catalyzed carbenoid  
cyclopropanations

AUTHOR(S): Davies, Huw M. L.; Antoulinakis, Evan G.

CORPORATE SOURCE: State University of New York at Buffalo, Buffalo, NY,  
USA

SOURCE: Organic Reactions (Hoboken, NJ, United States) (

Serial No.:10/691,095

2001), 57, No pp. given

CODEN: ORHNBA

URL: <http://www3.interscience.wiley.com/cgi-bin/mrwhome/107610747/HOME>

PUBLISHER:

John Wiley & Sons, Inc.

DOCUMENT TYPE:

Journal; General Review; (online computer file)

LANGUAGE:

English

OTHER SOURCE(S):

CASREACT 149:555106

ED Entered STN: 19 Nov 2008

AB A review of the article Intermol. metal-catalyzed carbenoid cyclopropanations.

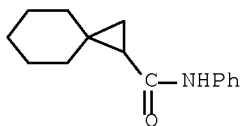
IT 17202-89-0P 105311-14-6P

RL: SPN (Synthetic preparation); PREP (Preparation)

(Intermol. Metal-Catalyzed Carbenoid Cyclopropanations)

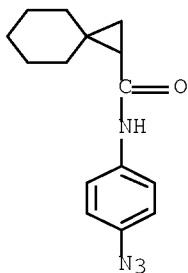
RN 17202-89-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-phenyl- (CA INDEX NAME)



RN 105311-14-6 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(4-azidophenyl)- (CA INDEX NAME)



L25 ANSWER 2 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2008:1383595 HCAPLUS Full-text

bad date (2005, not 1982

DOCUMENT NUMBER: 149:555101

as this appears to be)

TITLE: Allylic and benzylic carbanions substituted by heteroatoms

AUTHOR(S): Biellmann, Jean-Francois; Ducep, Jean-Bernard

CORPORATE SOURCE: Strasbourg, Fr.

SOURCE: Organic Reactions (Hoboken, NJ, United States) (1982), 27, No pp. given

CODEN: ORHNBA

URL: <http://www3.interscience.wiley.com/cgi-bin/mrwhome/107610747/HOME>

PUBLISHER:

John Wiley & Sons, Inc.

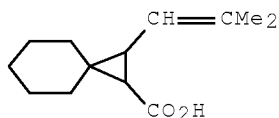
DOCUMENT TYPE:

Journal; General Review; (online computer file)

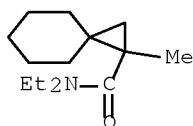
LANGUAGE:

English

OTHER SOURCE(S): CASREACT 149:555101  
 ED Entered STN: 19 Nov 2008  
 AB A review of the article Allylic and benzylic carbanions substituted by heteroatoms.  
 IT ~~26069-11-4F~~  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (Allylic and Benzylic Carbanions Substituted by Heteroatoms)  
 RN 26069-11-4 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 2-(2-methyl-1-propen-1-yl)- (CA INDEX NAME)



L25 ANSWER 3 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2002:471580 HCAPLUS Full-text  
 DOCUMENT NUMBER: 137:310623  
 TITLE: Complete stereospecific cyclopropanation of  $\alpha,\beta$ -unsaturated amides promoted by Sm/CH<sub>2</sub>I<sub>2</sub>  
 AUTHOR(S): Concellon, Jose M.; Rodriguez-Solla, Humberto; Gomez, Cecilia  
 CORPORATE SOURCE: Departamento de Quimica Organica e Inorganica Facultad de Quimica, Universidad de Oviedo, Oviedo, 33071, Spain  
 SOURCE: Angewandte Chemie, International Edition (2002), 41(11), 1917-1919  
 CODEN: ACIEF5; ISSN: 1433-7851  
 PUBLISHER: Wiley-VCH Verlag GmbH  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 137:310623  
 ED Entered STN: 24 Jun 2002  
 AB Complete stereospecific cyclopropanation of  $\alpha,\beta$ -unsatd. amides R<sup>1</sup>CR<sup>2</sup>:CR<sup>3</sup>CONR<sup>4</sup>2, in which the double bond is di-, tri-, or tetrasubstituted, is promoted by Sm/CH<sub>2</sub>I<sub>2</sub>. The reaction is high yielding and unaffected by the bulk of the substituents R<sup>1</sup>-R<sup>4</sup>.  
 IT ~~471278-64-5F~~  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (stereospecific cyclopropanation of  $\alpha,\beta$ -unsatd. amides promoted by Sm/CH<sub>2</sub>I<sub>2</sub>)  
 RN 471278-64-5 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide, N,N-diethyl-1-methyl- (CA INDEX NAME)



OS.CITING REF COUNT: 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13 CITINGS)  
 REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L25 ANSWER 4 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1995:401083 HCAPLUS Full-text

DOCUMENT NUMBER: 123:169252

ORIGINAL REFERENCE NO.: 123:30203a,30206a

TITLE: Synthesis of pyrethrin precursors and methylene lactones by decarboxylation of 1,1,2-cyclopropanetricarboxylic acids

AUTHOR(S): Benayache, S.; Benayache, F.; Jullien, R. F.; Wanat, M.

CORPORATE SOURCE: Inst. Chimie, Univ. de Constantine, Constantine, 25000, Algeria

SOURCE: Journal de la Societe Algerienne de Chimie (1992), 2(2), 99-110

CODEN: JSACEX; ISSN: 1111-4797

PUBLISHER: Societe Algerienne de Chimie

DOCUMENT TYPE: Journal

LANGUAGE: French

ED Entered STN: 08 Mar 1995

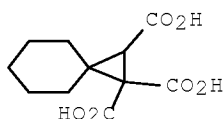
AB Cyclopropanetricarboxylic acids underwent decarboxylation in aprotic solvents. Cyclopropane ring opening occurs under acidic conditions. Thus, 3,3-dimethyl-1,1,2-cyclopropanetricarboxylic acid was treated with NaH in HMPT or 10% H2SO4 to afford cis- and trans-3,3-dimethyl-1,2-cyclopropanedicarboxylic acid or  $\gamma,\gamma$ -dimethyl- $\alpha,\beta$ -dicarboxy- $\gamma$ -butyrolactone, resp.

IT 1021-30-3

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (synthesis of pyrethrin precursors and methylene lactones by decarboxylation of cyclopropanetricarboxylic acids)

RN 1021-30-3 HCAPLUS

CN Spiro[2.5]octane-1,1,2-tricarboxylic acid (CA INDEX NAME)



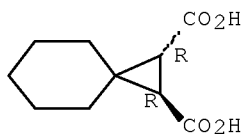
IT 67911-20-0P 68194-50-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of pyrethrin precursors and methylene lactones by decarboxylation of cyclopropanetricarboxylic acids)

RN 67911-20-0 HCAPLUS

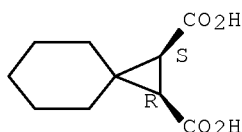
CN Spiro[2.5]octane-1,2-dicarboxylic acid, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



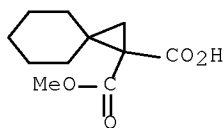
RN 68194-50-3 HCAPLUS  
CN Spiro[2.5]octane-1,2-dicarboxylic acid, cis- (9CI) (CA INDEX NAME)

Relative stereochemistry.

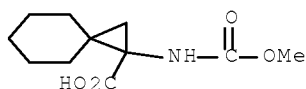


L25 ANSWER 5 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 1995:231440 HCAPLUS Full-text  
DOCUMENT NUMBER: 122:10523  
ORIGINAL REFERENCE NO.: 122:2337a,2340a  
TITLE: Straightforward Synthesis of  
1-Amino-2,2-dialkylcyclopropanecarboxylic Acids via  
Selective Saponification of  
2,2-Dialkylcyclopropane-1,1-dicarboxylic Esters and  
Curtius Rearrangement  
AUTHOR(S): De Kimpe, Norbert; Boeykens, Marc; Tehrani, Kourosch  
Abbaspour  
CORPORATE SOURCE: Faculty of Agricultural and Applied Biological  
Sciences, University of Gent, Ghent, B-9000, Belg.  
SOURCE: Journal of Organic Chemistry (1994), 59(26),  
8215-19  
CODEN: JOCEAH; ISSN: 0022-3263  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 122:10523  
ED Entered STN: 08 Dec 1994  
AB Selective monosaponification of di-Me 2,2-dialkylcyclopropane-1,1-dicarboxylic  
esters afforded the corresponding 2,2-dialkyl-1-(methoxycarbonyl)cyclopropane-  
1-carboxylic acids, which were rearranged with di-Ph phosphoroazidate via a  
modified Curtius-type reaction to give Me 2,2-dialkyl-1-(N-  
(alkoxycarbonyl)amino)cyclopropanecarboxylic esters. Selective deprotection  
of the carbamate or Me cyclopropanecarboxylic ester was worked out, giving  
rise to a whole variety of aminocyclopropanecarboxylate analogs.  
IT ~~159279-66-0P~~  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(straightforward synthesis of amino(dialkyl)cyclopropanecarboxylic  
acids via selective saponification of diesters and Curtius rearrangement)  
RN 159279-66-0 HCAPLUS  
CN Spiro[2.5]octane-1,1-dicarboxylic acid, 1-methyl ester (CA INDEX NAME)

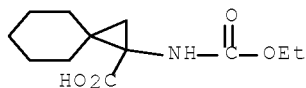




IT 159279-75-1P 159279-76-2P 159279-82-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (straightforward synthesis of amino(dialkyl)cyclopropanecarboxylic  
 acids via selective saponification of diesters and Curtius rearrangement)  
 RN 159279-75-1 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1-[(methoxycarbonyl)amino]- (CA INDEX  
 NAME)



RN 159279-76-2 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1-[(ethoxycarbonyl)amino]- (CA INDEX  
 NAME)



RN 159279-82-0 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1-amino- (CA INDEX NAME)



OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS  
 RECORD (18 CITINGS)

L25 ANSWER 6 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1993:448977 HCAPLUS Full-text  
 DOCUMENT NUMBER: 119:48977  
 ORIGINAL REFERENCE NO.: 119:8869a,8872a  
 TITLE: Surface nature of Grignard reagent formation. Chiral  
 1-methylspiro[2.5]octylmagnesium bromide

Serial No.:10/691,095

AUTHOR(S): Hamdouchi, C.; Topolski, M.; Goedken, V.; Walborsky, H. M.  
 CORPORATE SOURCE: Dittmer Lab. Chem., Florida State Univ., Tallahassee, FL, 32306, USA  
 SOURCE: Journal of Organic Chemistry (1993), 58(11), 3148-55  
 CODEN: JOCEAH; ISSN: 0022-3263  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 119:48977  
 ED Entered STN: 07 Aug 1993  
 GI



AB The synthesis of chiral 1-bromo-1-methylspiro[2.5]octane (I) is described. The absolute configuration of I has been established as (S)-(+). From stereochem., product anal., and radical trapping expts. it is concluded that the reaction of chiral I with magnesium to form the corresponding Grignard reagent occurs mainly on the surface of the magnesium.

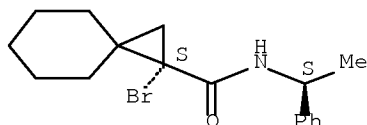
IT 148065-45-6P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (preparation and crystal and mol. structure of)

RN 148065-45-6 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 1-bromo-N-(1-phenylethyl)-, [S-(R\*,R\*)]-(9CI) (CA INDEX NAME)

Absolute stereochemistry.



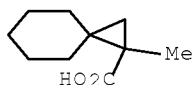
IT 42077-50-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and reaction of, with chiral  $\alpha$ -methylbenzylamine)

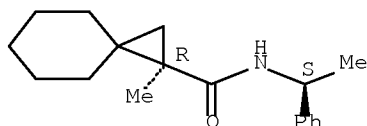
RN 42077-50-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 1-methyl- (CA INDEX NAME)



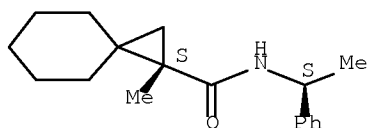
IT ~~148065-49-0P~~ 148601-33-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of)  
 RN 148065-49-0 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide, 1-methyl-N-(1-phenylethyl)-, [S-(R\*,S\*)]-  
 (9CI) (CA INDEX NAME)

Absolute stereochemistry.

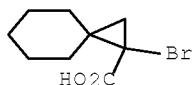


RN 148601-33-6 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide, 1-methyl-N-(1-phenylethyl)-, [S-(R\*,R\*)]-  
 (9CI) (CA INDEX NAME)

Absolute stereochemistry.



IT ~~148065-44-5P~~  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation, resolution, reduction and amidation of)  
 RN 148065-44-5 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1-bromo- (CA INDEX NAME)

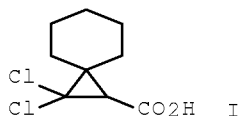


OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS  
 RECORD (17 CITINGS)

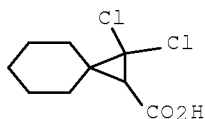
L25 ANSWER 7 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1991:43192 HCAPLUS Full-text  
 DOCUMENT NUMBER: 114:43192  
 ORIGINAL REFERENCE NO.: 114:7525a,7528a  
 TITLE: Synthesis of potent pyrethroids:  
 $\alpha$ (RS)-cyano-4-fluoro-benzyl/3-phenoxybenzyl  
 2,2-dichloro-spiro (2,5)-octane-1-carboxylates  
 AUTHOR(S): Sattar, A. K.; Arbale, A. A.; Kulkarni, G. H.

Serial No.:10/691,095

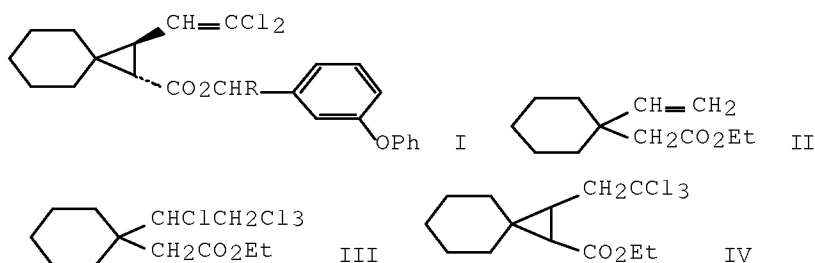
CORPORATE SOURCE: Natl. Chem. Lab., Pune, 411 008, India  
 SOURCE: Synthetic Communications (1990), 20(14),  
 2217-23  
 CODEN: SYNCAV; ISSN: 0039-7911  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 114:43192  
 ED Entered STN: 09 Feb 1991  
 GI



AB A simple facile synthesis of 2,2-dichloro-spiro (2,5)-octane-1-carboxylic acid (I) was described. I was converted into the corresponding  $\alpha$ -(RS) cyano 3-phenoxybenzyl ester, exhibiting high insecticidal activity against Musca domestica and Aedes egyptii.  
 IT 131447-79-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation and correlation or esterification of)  
 RN 131447-79-5 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 2,2-dichloro- (CA INDEX NAME)



L25 ANSWER 8 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1989:192300 HCAPLUS Full-text  
 DOCUMENT NUMBER: 110:192300  
 ORIGINAL REFERENCE NO.: 110:31909a,31912a  
 TITLE: Synthesis of insecticidally active 3-phenoxybenzyl and  $\alpha$ -(RS)-cyano-3-phenoxybenzyl ( $\pm$ )-trans-2-(2,2-dichlorovinyl)spiro[2.5]octane-1-carboxylates  
 AUTHOR(S): Kulkarni, G. H.; Arbale, A. A.  
 CORPORATE SOURCE: Natl. Chem. Lab., Pune, India  
 SOURCE: Synthetic Communications (1988), 18(16-17),  
 2147-59  
 CODEN: SYNCAV; ISSN: 0039-7911  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 110:192300  
 ED Entered STN: 26 May 1989  
 GI



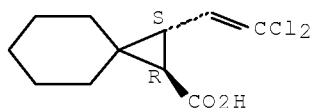
AB The preparation of the title compds. I (R = H, cyano) from cyclohexanone and Ph<sub>3</sub>P:CHCO<sub>2</sub>Et is reported. Key reactions include the condensation-Claisen rearrangement of cyclohexylideneethanol with MeC(OEt)<sub>3</sub> to give (vinylcyclohexyl)acetate II and the ring closure of [(tetrachloropropyl)cyclohexyl]acetate III to give trichloroethylspirooctanecarboxylate IV.

IT 120368-79-8P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and conversion of, to acid chloride)

RN 120368-79-8 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2-(2,2-dichloroethenyl)-, (1R,2S)-rel-  
 (CA INDEX NAME)

Relative stereochemistry.



OS.CITING REF COUNT: 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD  
 (3 CITINGS)

L25 ANSWER 9 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1987:84111 HCAPLUS Full-text

DOCUMENT NUMBER: 106:84111

ORIGINAL REFERENCE NO.: 106:13793a,13796a

TITLE: Selective reactions of azide-substituted  $\alpha$ -diazo amides with olefins and alcohols using rhodium(II) catalysts

AUTHOR(S): Jeganathan, Alwarsamy; Richardson, Stewart K.; Mani, Rajarathnam S.; Haley, Boyd E.; Watt, David S.

CORPORATE SOURCE: Lucille Parker Markey Cancer Cent., Univ. Kentucky, Lexington, KY, 40506, USA

SOURCE: Journal of Organic Chemistry (1986), 51(26), 5362-7

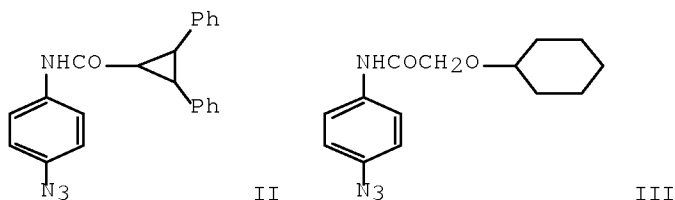
CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 106:84111

ED Entered STN: 21 Mar 1987  
GI



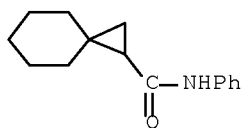
AB The synthesis and addition of azide-substituted  $\alpha$ -diazoacetamides such as 4-N<sub>3</sub>C<sub>6</sub>H<sub>4</sub>NHCOCHN<sub>2</sub> (I) and 4,2-N<sub>3</sub>(HO)C<sub>6</sub>H<sub>3</sub>NHCOCHN<sub>2</sub> to olefins and alcs. using either Rh(OMe)<sub>2</sub> or preferably Rh(O<sub>2</sub>CCMe<sub>3</sub>)<sub>2</sub> provided cyclopropanecarboxamides, e.g., II, and  $\alpha$ -alkoxyacetamides, e.g., III, resp., without disrupting the azide functionality. Thus, 4-H<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NH<sub>2</sub> was treated with HO<sub>2</sub>CCH<sub>2</sub>NHCO<sub>2</sub>CMe<sub>3</sub> and DCC in THF to give 4-H<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>NHCOCH<sub>2</sub>NHCO<sub>2</sub>CMe<sub>3</sub> which was treated with NaNO<sub>2</sub> and HCl in aqueous THF, and then NaN<sub>3</sub> to give 4-N<sub>3</sub>C<sub>6</sub>H<sub>4</sub>NHCOCH<sub>2</sub>NHCO<sub>2</sub>CMe<sub>3</sub>. Deprotection of the latter compound with HCl-AcOH and then treatment with NaNO<sub>2</sub> and AcOH in a mixture of THF, AcOEt and H<sub>2</sub>O gave 69% I. Treating I with (E)-PhCH:CHPh in the presence of Rh(O<sub>2</sub>CCMe<sub>3</sub>)<sub>2</sub> in MeOCH<sub>2</sub>CH<sub>2</sub>OMe gave 30% II, whereas, similar treatment of I with cyclohexanol in the presence of Rh(O<sub>2</sub>CCMe<sub>3</sub>)<sub>2</sub> gave 59% III. Azide-bearing  $\alpha$ -diazo amides are potentially useful in the preparation of photoaffinity crosslinking reagents for studying the mechanism of action of natural products.

IT 17202-89-0P 105311-14-6P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

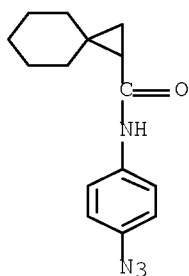
RN 17202-89-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-phenyl- (CA INDEX NAME)



RN 105311-14-6 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, N-(4-azidophenyl)- (CA INDEX NAME)



OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD  
(6 CITINGS)

L25 ANSWER 10 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1983:612236 HCAPLUS Full-text

DOCUMENT NUMBER: 99:212236

ORIGINAL REFERENCE NO.: 99:32651a,32654a

TITLE: Synthesis and addition reactions of  
2-phenyl-1-cyclopropene-1-carboxylates

AUTHOR(S): Norden, Wolfgang; Sander, Volker; Weyerstahl, Peter

CORPORATE SOURCE: Inst. Org. Chem., Tech. Univ. Berlin, Berlin, D-1000,  
Fed. Rep. Ger.

SOURCE: Chemische Berichte (1983), 116(9), 3097-111

CODEN: CHBEAM; ISSN: 0009-2940

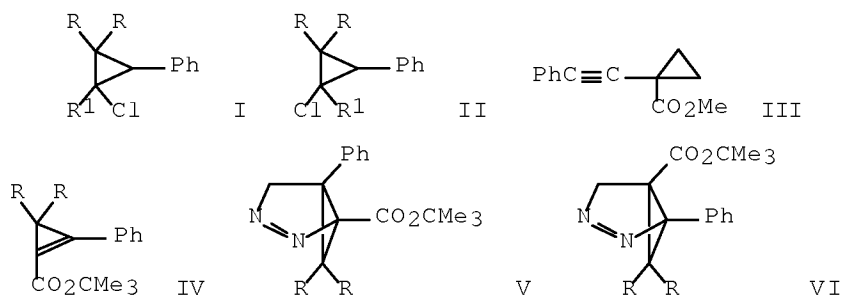
DOCUMENT TYPE: Journal

LANGUAGE: German

OTHER SOURCE(S): CASREACT 99:212236

ED Entered STN: 12 May 1984

GI



AB RRC:CHPh [R = Me, Ph; RR = (CH<sub>2</sub>)<sub>n</sub> (n = 3-6)] were converted into cyclopropanecarboxylic acids I and II (R<sub>1</sub> = CO<sub>2</sub>H) via I (R<sub>1</sub> = Cl). Spiropentane I [RR = (CH<sub>2</sub>)<sub>2</sub>, R<sub>1</sub> = Cl] gave ethynylcyclopropane III via anionic ring cleavage with BuLi. I and II (R = CO<sub>2</sub>CMe<sub>3</sub>) gave cyclopropenes IV, but the trans isomers I reacted much faster than cis isomers II. C-3 unsubstituted chlorocyclopropanecarboxylates do not give stable cyclopropene esters even with Li dialkylamides. Addition reactions of CH<sub>2</sub>N<sub>2</sub>, thiophenolate, malonate, and CH<sub>2</sub>(CN)<sub>2</sub> with IV were studied. Thus, e.g., IV and CH<sub>2</sub>N<sub>2</sub> gave bicyclic pyrazolines V and VI.

IT 87957-51-5P

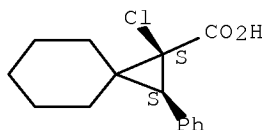
Serial No.:10/691,095

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and esterification of, with isobutene)

RN 87957-51-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 1-chloro-2-phenyl-, cis- (9CI) (CA  
INDEX NAME)

Relative stereochemistry.



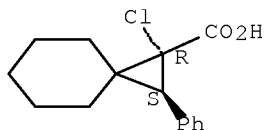
IT 87957-52-6P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 87957-52-6 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 1-chloro-2-phenyl-, trans- (9CI) (CA  
INDEX NAME)

Relative stereochemistry.



OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD  
(6 CITINGS)

L25 ANSWER 11 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1980:549871 HCAPLUS Full-text

DOCUMENT NUMBER: 93:149871

ORIGINAL REFERENCE NO.: 93:23879a,23882a

TITLE: Studies in the cyclohexane series. Part XX. Study on  
the products of hydrolysis of mono- and dibromo esters  
of 3,4-dimethylcyclohexane-1,1-diacetic acid

AUTHOR(S): Gautam, R. K.; Saharia, G. S.

CORPORATE SOURCE: Dep. Chem., Univ. Delhi, Delhi, 110007, India

SOURCE: Journal of the Institution of Chemists (India) (1978), 50(6), 259-63

CODEN: JOICA7; ISSN: 0020-3254

DOCUMENT TYPE: Journal

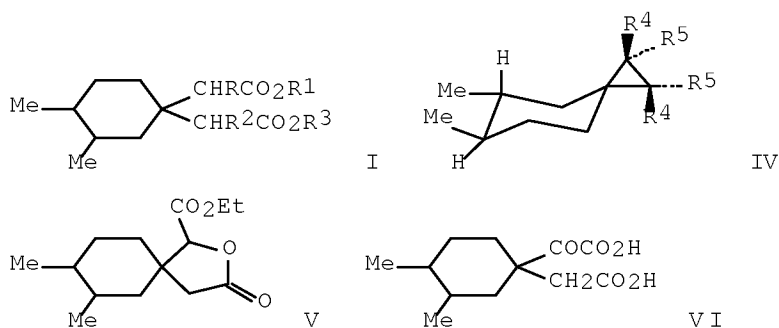
LANGUAGE: English

OTHER SOURCE(S): CASREACT 93:149871

ED Entered STN: 12 May 1984

GI





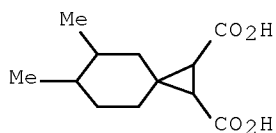
AB Cyclohexanediacetates I [R = R<sub>1</sub> = H, R<sub>2</sub> = Br, R<sub>3</sub> = Et (II); R = R<sub>2</sub> = Br, R<sub>1</sub> = R<sub>3</sub> = Et (III)] were prepared and their hydrolysis products were examined. Thus, refluxing the anhydride of I (R = R<sub>3</sub> = H) in EtOH gave I (R = R<sub>2</sub> = H, R<sub>3</sub> = Et) which was monobrominated by Br-PCl<sub>5</sub> to give 65% II. Hydrolysis of II by KOH gave IV (R<sub>4</sub> = H, R<sub>5</sub> = CO<sub>2</sub>H; R<sub>4</sub> = CO<sub>2</sub>H, R<sub>5</sub> = H) and V. and V. Bromination of I (R = R<sub>3</sub> = H) by Br gave I (R = R<sub>2</sub> = Br, R<sub>1</sub> = R<sub>3</sub> = H). Esterification of this dibromo acid with EtOH gave III. III was hydrolyzed by refluxing with KOH to give VI.

IT 74281-66-6P

RL: FORM (Formation, nonpreparative); PREP (Preparation)  
(formation of, during hydrolysis of cyclohexanebromodiacetate)

RN 74281-66-6 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 5,6-dimethyl-, stereoisomer (CA INDEX NAME)

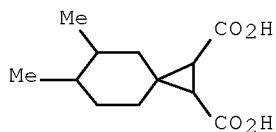


IT 74244-35-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and hydrolysis of)

RN 74244-35-2 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 5,6-dimethyl-, stereoisomer (CA INDEX NAME)



IT 74282-01-2P 74310-28-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

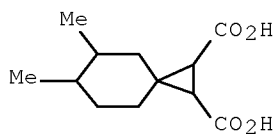
RN 74282-01-2 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 5,6-dimethyl-, stereoisomer,  
compd. with phenylmethyl carbamimidothioate (9CI) (CA INDEX NAME)

CM 1

CRN 74244-35-2

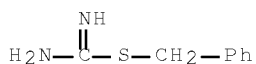
CMF C12 H18 O4



CM 2

CRN 621-85-2

CMF C8 H10 N2 S



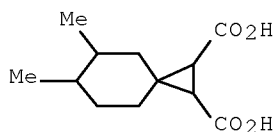
RN 74310-28-4 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 5,6-dimethyl-, stereoisomer,  
compd. with phenylmethyl carbamimidothioate (9CI) (CA INDEX NAME)

CM 1

CRN 74281-66-6

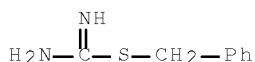
CMF C12 H18 O4



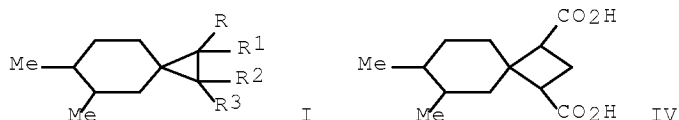
CM 2

CRN 621-85-2

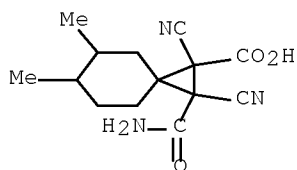
CMF C8 H10 N2 S



L25 ANSWER 12 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1980:75937 HCAPLUS Full-text  
 DOCUMENT NUMBER: 92:75937  
 ORIGINAL REFERENCE NO.: 92:12499a,12502a  
 TITLE: Studies in the cyclohexane series. Part XXI.  
 Synthesis of 5,6-dimethylspiro[2.5]octane-1,2- and  
 6,7-dimethylspiro[3.5]nonane-1,3-dicarboxylic acids  
 AUTHOR(S): Gautam, R. K.; Saharia, G. S.  
 CORPORATE SOURCE: Dep. Chem., Univ. Delhi, Delhi, 110007, India  
 SOURCE: Journal of the Institution of Chemists (India) (1979), 51(1), 25-8  
 CODEN: JOICA7; ISSN: 0020-3254  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 92:75937  
 ED Entered STN: 12 May 1984  
 GI



AB 5,6-Dimethylspiro[2.5]octane-1,2-dicarboxylic acid (I; R = R3 = H, R1 = R2 = CO2H) (II) was prepared by brominating  $\alpha,\alpha$ -dicyano-3,4-dimethyl-1,1-cyclohexanediacytic acid imide (III) followed by treatment with HCO2H to give I (R = R3 = CN, R1R2 = CONHCO), which was hydrolyzed and the tetracarboxylic acid was partially decarboxylated to give cis-II. Cyclization of III with CH2I2 followed by similar hydrolysis and decarboxylation gave cis-IV.  
 IT 72612-65-8P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation and hydrolysis of)  
 RN 72612-65-8 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid,  
 2-(aminocarbonyl)-1,2-dicyano-5,6-dimethyl- (CA INDEX NAME)

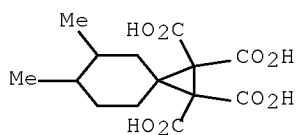


IT 72612-66-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and partial decarboxylation of)

RN 72612-66-9 HCAPLUS

CN Spiro[2.5]octane-1,1,2,2-tetracarboxylic acid, 5,6-dimethyl- (CA INDEX NAME)

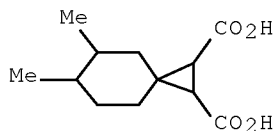


IT 72612-67-0P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 72612-67-0 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 5,6-dimethyl- (CA INDEX NAME)



L25 ANSWER 13 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1979:137315 HCAPLUS Full-text

DOCUMENT NUMBER: 90:137315

ORIGINAL REFERENCE NO.: 90:21757a,21760a

TITLE: An improved procedure for the homologation of cycloalkanones

AUTHOR(S): Saunier, Yves Marie; Danion-Bougot, Renee; Danion, Daniel; Carrie, Robert

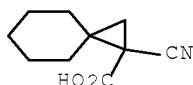
CORPORATE SOURCE: Groupe Rech. Physicochim. Struct., Univ. Rennes, Rennes, Fr.

SOURCE: Journal of Chemical Research, Synopses (1978), (11), 436-7

CODEN: JRPSDC; ISSN: 0308-2342

DOCUMENT TYPE: Journal

LANGUAGE: English/French  
 OTHER SOURCE(S): CASREACT 90:137315  
 ED Entered STN: 12 May 1984  
 GI For diagram(s), see printed CA Issue.  
 AB Treating cycloalkylidenecyanoacetates I (n = 4, 5, 6, 7, 11), available through Cope-Knoevenagel condensations from cycloalkanones, with diazomethane at -20° followed by thermolysis of the resulting pyrazolines gave I (n = 5, 6, 7, 8, 12, resp.). The latter compds. could either be further ring enlarged or hydrolyzed to give the corresponding cycloalkanones. Overall yields of cycloalkanone for a single ring enlargement were as high as 76%; and for an enlargement by 2 or 3 C atoms, yields of up to 72% were obtained. 2-Methylcyclooctadecanone, readily available by this procedure, is a very convenient precursor of muscone.  
 IT ~~69586-12-5P~~  
 RL: SPN (Synthetic preparation); PREP (Preparation) (preparation of)  
 RN 69586-12-5 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1-cyano- (CA INDEX NAME)

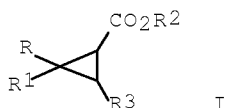


OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L25 ANSWER 14 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1978:597047 HCAPLUS Full-text  
 DOCUMENT NUMBER: 89:197047  
 ORIGINAL REFERENCE NO.: 89:30615a,30618a  
 TITLE: Racemic disubstituted alkyl cis- and trans-3-formylcyclopropane-1-carboxylates  
 PATENT ASSIGNEE(S): Roussel-UCLAF, Fr.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 53084947	A	19780726	JP 1977-157521	19771228 <--
JP 62003141	B	19870123		
FR 2376120	A1	19780728	FR 1976-39533	19761230 <--
FR 2376120	B1	19801003		
BE 862461	A1	19780629	BE 1977-183959	19771229 <--
GB 1596030	A	19810819	GB 1977-54178	19771229 <--
CH 627149	A5	19811231	CH 1977-16306	19771230 <--
CH 627731	A5	19820129	CH 1981-2798	19810429 <--
JP 61171453	A	19860802	JP 1985-258818	19851120 <--
PRIORITY APPLN. INFO.:			FR 1976-39533	A 19761230 <--
			CH 1977-16306	A 19771230 <--

OTHER SOURCE(S): CASREACT 89:197047; MARPAT 89:197047  
 ED Entered STN: 12 May 1984  
 GI



AB Racemic esters (I; R, R1 = C1-16 alkyl, RR1 = C3-7 alkylene; R2 = C1-6 alkyl; R3 = CHO) were prepared by reduction of half esters (I; R, R1, R2 as above; R3 = CO2H) followed by oxidation of the hydroxymethyl derivs. (I; R, R1, R2 as above, R3 = CH2OH). Thus, 0.001 mol trans-I (R = R1 = Me, R2 = Et, R3 = CO2H) was reduced with 0.004 mol B2H6 in THF under N to give 70% trans-I (R = R1 = Me, R2 = Et, R3 = CH2OH), which (0.001 mol) was oxidized by 0.0015 mol CrO3-pyridine complex under N to give 66% trans-I (R = R1 = Me, R2 = Et, R3 = CHO). Similarly prepared were 3 addnl. trans-I [R3 = CHO: RR1 = (CH2)5, R2 = Me; RR1 = (CH2)6, R2 = Et; R = R1 = R2 = Et].

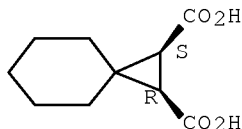
IT 68194-50-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and dehydration of)

RN 68194-50-3 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, cis- (9CI) (CA INDEX NAME)

Relative stereochemistry.



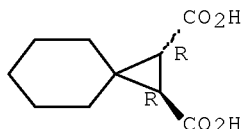
IT 67911-20-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and isomerization of)

RN 67911-20-0 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.

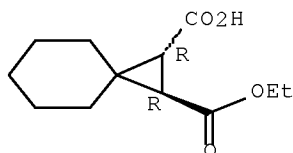


IT 67911-12-0 67911-27-7

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reduction of)

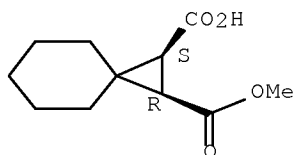
RN 67911-12-0 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, monoethyl ester, trans- (9CI) (CA  
 INDEX NAME)

Relative stereochemistry.



RN 67911-27-7 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, monomethyl ester, cis- (9CI) (CA  
 INDEX NAME)

Relative stereochemistry.



OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD  
 (3 CITINGS)

L25 ANSWER 15 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1978:579565 HCAPLUS Full-text  
 DOCUMENT NUMBER: 89:179565  
 ORIGINAL REFERENCE NO.: 89:27878h,27879a  
 TITLE: New stereospecific synthesis of cis and trans  
 d,l-chrysanthemic esters and analogs via a common  
 intermediate  
 AUTHOR(S): Devos, M. J.; Denis, J. N.; Krief, A.  
 CORPORATE SOURCE: Dep. Chem., Univ. Namur, Namur, Belg.  
 SOURCE: Tetrahedron Letters (1978), (21), 1847-50  
 CODEN: TELEAY; ISSN: 0040-4039  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 ED Entered STN: 12 May 1984  
 GI



Serial No.:10/691,095

AB The hemicaronic aldehydes I [R = Et, R1 = R2 = Me, Et, R1R2 = (CH2)5; R = Me, R1R2 = (CH2)4] (R3 =  $\beta$ -CHO) and I [R = Me, R1 = R2 = Me, Et, R1R2 = (CH2)5] (R3 =  $\alpha$ -CHO), known precursors of trans and cis chrysanthemic esters and analogs, were prepared stereospecifically from cis- or trans-RO2CCH:CHCO2R, initially by reaction with Ph3P+C-R1R2 to give I (R3 =  $\beta$ -CO2R). The latter were converted to trans aldehydes by sequential treatment with KOH-ROH, B2H6.THF, and CrO3-pyridine. The I (R3 =  $\beta$ -CO2R) were converted to cis aldehydes by sequential treatment with KOH-ROH, Ac2O, MeOH-pyridine, B2H6.THF, and CrO3-pyridine.

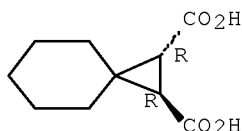
IT 67911-20-0P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and dehydration of, anhydride from)

RN 67911-20-0 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, trans- (9CI) (CA INDEX NAME)

Relative stereochemistry.



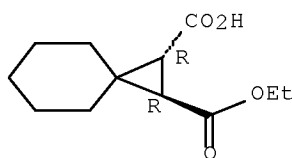
IT 67911-12-0P 67911-27-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and diborane reduction of)

RN 67911-12-0 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, monoethyl ester, trans- (9CI) (CA INDEX NAME)

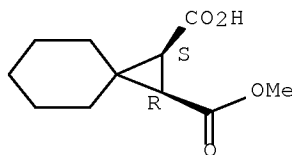
Relative stereochemistry.



RN 67911-27-7 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, monomethyl ester, cis- (9CI) (CA INDEX NAME)

Relative stereochemistry.





OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD  
(6 CITINGS)

L25 ANSWER 16 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1977:170935 HCAPLUS Full-text  
 DOCUMENT NUMBER: 86:170935  
 ORIGINAL REFERENCE NO.: 86:26837a,26840a  
 TITLE: Cyclopropanecarboxylic acids and esters  
 INVENTOR(S): Martel, Jacques; Huynh, Chanh; Buendia, Jean  
 PATENT ASSIGNEE(S): Roussel-UCLAF, Fr.  
 SOURCE: U.S., 22 pp. Division of U.S. 3,786,052.  
 CODEN: USXXAM  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 6  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 3997586	A	19761214	US 1973-395146	19730907 <--
US 3786052	A	19740115	US 1971-168441	19710802 <--
US 4206140	A	19800603	US 1978-910695	19780530 <--
PRIORITY APPLN. INFO.:			US 1967-662278	A2 19670822 <--
			US 1969-879942	A2 19691125 <--
			US 1971-168441	A3 19710802 <--
			FR 1966-74404	A 19660826 <--
			FR 1966-74405	A 19660826 <--
			FR 1967-96425	A 19670224 <--
			FR 1967-110719	A 19670616 <--
			FR 1967-114833	19670719 <--
			FR 1968-175375	A 19681126 <--
			US 1973-395146	A3 19730907 <--
			US 1976-749402	A3 19761210 <--

ED Entered STN: 12 May 1984  
 GI

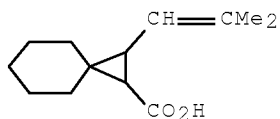


AB About 20 carboxylates [I, Z = Et2C, (Me2CHCH2)2C, Ph2C, cyclopentylidene, cyclohexylidene, Pr2C, EtCHMeCH(CHMe2), etc.; R = 5-benzyl-2-furylmethyl, 3-(2-cyclohexen-1-yl)-2-methyl-4-oxo-2-cyclopenten-1-yl, residue of allethrolone or cinerolone], useful as insecticides (no data), were prepared, e.g., by treating the appropriate carboxylic acid chlorides with alcs. Thus, I (Z = Et2C, R = Et), obtained by condensation of Et2C:CHCH2SO2Ph with Me2C:CHCO2Et, was hydrolyzed and the acid esterified with allethrolone to give I (Z = Et2C, R = allethrolone residue).

IT ~~26069-11-4P~~  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and acid chloride formation of)

RN 26069-11-4 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2-(2-methyl-1-propen-1-yl)- (CA INDEX NAME)



OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L25 ANSWER 17 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1975:527541 HCAPLUS Full-text  
 DOCUMENT NUMBER: 83:127541  
 ORIGINAL REFERENCE NO.: 83:20019a,20022a  
 TITLE: Pesticide composition containing cyclopropane carboxylates  
 PATENT ASSIGNEE(S): Shell Internationale Research Maatschappij B. V., Neth.  
 SOURCE: Neth. Appl., 15 pp.  
 CODEN: NAXXAN  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Dutch  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
NL 7413166	A	19750410	NL 1974-13166	19741007 <--
CA 1052797	A1	19790417	CA 1974-208231	19740830 <--
BE 820418	A2	19750327	BE 1974-1006199	19740927 <--
US 3950535	A	19760413	US 1974-510197	19740930 <--
DD 115841	A5	19751020	DD 1974-181521	19741004 <--
AU 7474004	A	19760408	AU 1974-74004	19741004 <--
FR 2246533	A1	19750502	FR 1974-33630	19741007 <--
FR 2246533	B1	19780324		
JP 50062957	A	19750529	JP 1974-114789	19741007 <--
JP 58021885	B	19830504		
DE 2447735	A1	19750821	DE 1974-2447735	19741007 <--
ZA 7406362	A	19751126	ZA 1974-6362	19741007 <--
BR 7408318	A	19760427	BR 1974-8318	19741007 <--
GB 1437987	A	19760603	GB 1973-46926	19741007 <--
HU 172534	B	19780928	HU 1974-SE1747	19741007 <--
CH 608170	A5	19781229	CH 1974-13441	19741007 <--
US 4021466	A	19770503	US 1975-607396	19750825 <--
PRIORITY APPLN. INFO.:			GB 1973-46926	A 19731008 <--
			US 1974-510197	A3 19740930 <--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

ED Entered STN: 12 May 1984

GI For diagram(s), see printed CA Issue.

AB Insecticidal and acaricidal spirocyclopropanecarboxylates were prepared with the general formula I (R = R1 = alkyl; R2 = H, alkynyl, or CN; R3 = aromatic or heterocyclic group; n = 2-5). For example, 5-benzylfur-3-ylmethyl 2,2-dimethyl-3- spiro(cyclobutane)cyclopropanecarboxylate (II) [56338-11-5], applied as a 0.7% suspension to leaves of host plants, was totally effective against spider mites (*Tetranychus urticae*), cabbageworms (*Pieris brassicae*),

Serial No.:10/691,095

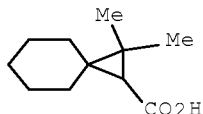
and aphids (*Megoura viciae*) and partially effective against leaf beetles (*Phaedon cochleariae*). II was also effective against house flies when applied topically (1  $\mu$ l of a 1.0% solution). II was prepared from the corresponding acid by conversion to the acid chloride and reaction with 2-benzyl-4-hydroxymethylfuran [20416-09-5] in the presence of Et<sub>3</sub>N.

IT 55109-24-5

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with arylalkyl bromides)

RN 55109-24-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2,2-dimethyl- (CA INDEX NAME)



L25 ANSWER 18 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1975:86117 HCAPLUS Full-text

DOCUMENT NUMBER: 82:86117

ORIGINAL REFERENCE NO.: 82:13763a,13766a

TITLE: 1-Halocyclobutan-2-ones

INVENTOR(S): Boyce, Clive B. C.; Searle, Robert J. G.; Davis, Royston Henry

PATENT ASSIGNEE(S): Shell Internationale Research Maatschappij B. V.

SOURCE: Ger. Offen., 11 pp.

CODEN: GWXXBX

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
DE 2417615	A1	19741107	DE 1974-2417615	19740410 <--
IT 1005785	B	19760930	IT 1974-42674	19740405 <--
BE 813520	A1	19741010	BE 1974-1005867	19740410 <--
FR 2225407	A1	19741108	FR 1974-12630	19740410 <--
BR 7402924	D0	19741119	BR 1974-2924	19740410 <--
JP 50030846	A	19750327	JP 1974-40129	19740410 <--
JP 58010371	B	19830225		
DD 113347	A5	19750612	DD 1974-177810	19740410 <--
HU 168443	B	19760428	HU 1974-SE1720	19740410 <--
SU 554809	A3	19770415	SU 1974-2014993	19740410 <--
CH 589584	A5	19770715	CH 1974-5024	19740410 <--
NL 7404949	A	19741018	NL 1974-4949	19740411 <--
NL 189756	B	19930216		
NL 189756	C	19930716		
GB 1437832	A	19760603	GB 1973-18195	19740411 <--
PRIORITY APPLN. INFO.:			GB 1973-18195	A 19730416 <--

ED Entered STN: 12 May 1984

GI For diagram(s), see printed CA Issue.

AB Eight cyclobutanones I [R = Me; R<sub>1</sub> = Me, Pr, Me<sub>2</sub>C:-CH, or Ph; or RR<sub>1</sub> = (CH<sub>2</sub>)<sub>2</sub>, (CH<sub>2</sub>)<sub>3</sub>, or (CH<sub>2</sub>)<sub>5</sub>; R<sub>2</sub> = H or Me; R<sub>3</sub> = Cl or Br], used for the preparation of the cyclopropanecarboxylic acids II, were prepared by halogenation of I (R<sub>3</sub> =

Serial No.:10/691,095

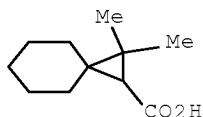
H). Thus, I (R = Me, R1 = Me2C:CH, R2 = R3 = H) was treated with SO2Cl2 in CHCl3 at 20° to give I (R = Me, R1 = Me2C:CH, R2 = H, R3 = Cl). Treatment of I (R = R1 = Me, R2 = R3 = H) with Br in CHCl3 gave I (R = R1 = Me, R2 = H, R3 = Br), which on refluxing in aqueous Na2CO3 gave II (R = R1 = Me, R2 = H).

IT 55109-24-5F

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 55109-24-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2,2-dimethyl- (CA INDEX NAME)



OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
(1 CITINGS)

L25 ANSWER 19 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1974:14632 HCAPLUS Full-text

DOCUMENT NUMBER: 80:14632

ORIGINAL REFERENCE NO.: 80:2457a,2460a

TITLE: Halogenated ketenes. XXIV. Cycloaddition of  
alkylhaloketenes and methylenecycloalkanes. Spiro  
compounds

AUTHOR(S): Brady, William T.; Patel, Arvind D.

CORPORATE SOURCE: Dep. Chem., North Texas State Univ., Denton, TX, USA

SOURCE: Journal of Organic Chemistry (1973), 38(24),  
4106-8

CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 80:14632

ED Entered STN: 12 May 1984

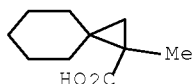
AB The cycloaddn. of methylchloroketene with methylenecyclohexane,  
methylenecyclobutane,  $\beta$ -pinene and 5-methylene-2-norbornene to yield the  
corresponding spiro[3.5] and spiro[3.3] ketones was investigated. The  
cycloaddn. of ethylchloroketene with methylenecyclobutane was also described.  
The spiro ketones were reduced to the corresponding spiro alcohols. Some  
base-catalyzed rearrangement reactions were described, including ring  
contractions to spiro[5.2] compounds.

IT 42077-50-9F

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 42077-50-9 HCAPLUS

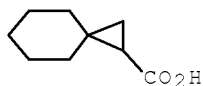
CN Spiro[2.5]octane-1-carboxylic acid, 1-methyl- (CA INDEX NAME)



Serial No.:10/691,095

OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD  
(2 CITINGS)

L25 ANSWER 20 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1972:413889 HCAPLUS Full-text  
 DOCUMENT NUMBER: 77:13889  
 ORIGINAL REFERENCE NO.: 77:2298h,2299a  
 TITLE: exo-Bicyclo[3.1.0]hexane-6-carboxylic acid and related  
 compounds, oral hypoglycemic agents  
 AUTHOR(S): Rynbrandt, Ronald H.; Dutton, Fred E.; Schmidt,  
 Fredericka L.  
 CORPORATE SOURCE: Diabetes Res., Upjohn Co., Kalamazoo, MI, USA  
 SOURCE: Journal of Medicinal Chemistry (1972),  
 15(4), 424-6  
 CODEN: JMCMAR; ISSN: 0022-2623  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 ED Entered STN: 12 May 1984  
 AB Exo-bicyclo[3.1.0]hexane-6-carboxylic acid (I) [4971-24-8] had good  
 hypoglycemic activity at 6.25 mg/kg in glucose-primed, fasted intact rat. A  
 number of related compds. were prepared by known methods to determine the  
 various structural features necessary for hypoglycemic activity. The bicyclic  
 ring system in I appears to be necessary for activity in that  
 cyclopropanecarboxylic acid [1759-53-1] and cyclohexanecarboxylic acid [98-89-  
 5] were both inactive. The exo configuration is required in that endo-  
 bicyclo[3.1.0]hexane-6-carboxylic acid [34898-25-4] was inactive. Variations  
 in the ring size gave exo-bicyclo[4.1.0]heptane-7-carboxylic acid (IIe [21448-  
 77-1], which possessed greater activity than I (2.0 mg/kg being the lowest  
 dose that consistently produced a hypoglycemic response). Larger ring compds.  
 (III and IV), a spirocyclopropane analog (V) and a tricyclic analog had little  
 or no activity. Exo-bicyclo[3.1.0]hexane-6-acetic acid (VII) [34898-27-6] had  
 good activity (12.5 mg/kg), as did all esters (VIII) and primary and secondary  
 amides (IX) of I.  
 IT 17202-86-7  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological  
 study, unclassified); BIOL (Biological study)  
 (hypoglycemic activity of)  
 RN 17202-86-7 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid (CA INDEX NAME)



OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
(1 CITINGS)

L25 ANSWER 21 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1972:25160 HCAPLUS Full-text  
 DOCUMENT NUMBER: 76:25160  
 ORIGINAL REFERENCE NO.: 76:4087a,4090a  
 TITLE: Reaction of tosylazocyclohexene with dienophiles  
 AUTHOR(S): Barbieri, W.; Bernardi, L.; Masi, P.; Vigevani, A.;  
 Caglioti, L.; Rosini, G.  
 CORPORATE SOURCE: Ist. Ric., Farmitalia, Milan, Italy  
 SOURCE: Tetrahedron (1971), 27(22), 5505-13

DOCUMENT TYPE:

Journal

LANGUAGE:

English

OTHER SOURCE(S):

CASREACT 76:25160

ED Entered STN: 12 May 1984

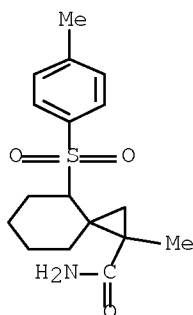
AB The stereochemistry of the 1:1 adducts of tosylazocyclohex-1-ene with various dienophiles ( $\Delta^1$ -pyrazolines) is discussed on the basis of chemical and physicochem. evidence. The structure of the  $\Delta^2$ -pyrazolines and the spirocyclopropanes arising from the adducts, is also discussed.

IT 34706-07-5P 34709-10-9P 34709-11-0P  
34709-12-1P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

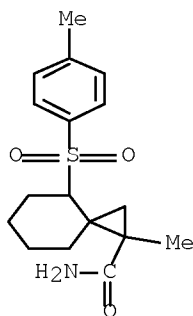
RN 34706-07-5 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 1-methyl-4-[(4-methylphenyl)sulfonyl]-,  
[1 $\alpha$ , 3 $\beta$ (S\*)]- (9CI) (CA INDEX NAME)



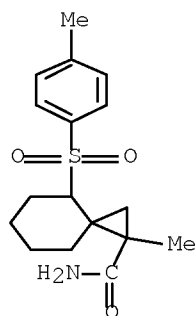
RN 34709-10-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 1-methyl-4-[(4-methylphenyl)sulfonyl]-,  
[1 $\alpha$ , 3 $\alpha$ (S\*)]- (9CI) (CA INDEX NAME)

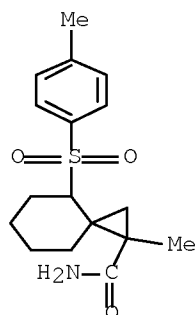


RN 34709-11-0 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide, 1-methyl-4-[(4-methylphenyl)sulfonyl]-,  
[1 $\alpha$ , 3 $\alpha$ (R\*)]- (9CI) (CA INDEX NAME)



RN 34709-12-1 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide, 1-methyl-4-[(4-methylphenyl)sulfonyl]-,  
 [1 $\alpha$ , 3 $\beta$ (R\*)]- (9CI) (CA INDEX NAME)



OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
 (1 CITINGS)

L25 ANSWER 22 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1970:100135 HCAPLUS Full-text  
 DOCUMENT NUMBER: 72:100135  
 ORIGINAL REFERENCE NO.: 72:18137a,18140a  
 TITLE: dl-Allethrolone esters of cyclopropanecarboxylic acids  
 INVENTOR(S): Martel, Jacques; Huynh Chanh  
 PATENT ASSIGNEE(S): Roussel-UCLAF  
 SOURCE: Fr., 8 pp.  
 CODEN: FRXXAK  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 6  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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FR 1507192	A1	19671229	FR 1966-74404	19660826 <--
FR 1527844	A1	19680607	FR 1967-96425	19670224 <--
BE 702662	A	19680214	BE 1967-702662	19670814 <--
CH 491071	A	19700531	CH 1967-491071	19670815 <--

Serial No.:10/691,095

CH 491851	A	19700615	CH 1967-491851	19670815 <--
CH 509961	A	19710715	CH 1969-18431	19670815 <--
IL 28541	A	19751125	IL 1967-28541	19670822 <--
IL 38182	A	19751125	IL 1967-38182	19670822 <--
SE 369517	B	19740902	SE 1967-11921	19670825 <--
DE 1793721	B2	19761223	DE 1967-1793721	19670825 <--
DE 1793721	C3	19770825		
SE 391330	B	19770214	SE 1971-133	19670825 <--
DK 140720	B	19791105	DK 1967-4303	19670825 <--
DK 140720	C	19800421		
SU 691076	A3	19791005	SU 1967-1182999	19670826 <--
NL 6711770	A	19680227	NL 1967-11770	19670828 <--
NL 162060	B	19791115		
NL 162060	C	19800415		
AT 287671	B	19710210	AT 1967-7899	19670828 <--
GB 1207371	A	19700930	GB 1967-1207371	19670829 <--
GB 1207372	A	19700930	GB 1967-1207372	19670829 <--
DK 131538	B	19750804	DK 1970-6573	19701228 <--
DK 133579	B	19760614	DK 1970-6572	19701228 <--
US 3786052	A	19740115	US 1971-168441	19710802 <--
US 4206140	A	19800603	US 1978-910695	19780530 <--
NL 7906529	A	19800131	NL 1979-6529	19790830 <--
NL 172853	B	19830601		
NL 172853	C	19831101		

PRIORITY APPLN. INFO.:

FR 1967-96425		19670224 <--
FR 1966-74405		19660826 <--
FR 1966-74404	A	19660826 <--
FR 1967-110719	A	19670616 <--
FR 1967-114833	A	19670719 <--
FR 1967-114883	A	19670719 <--
US 1967-662278	A2	19670822 <--
DK 1967-4303	A	19670825 <--
NL 1967-11770		19670828 <--
FR 1968-175375	A	19681126 <--
US 1969-879942	A	19691125 <--
US 1971-168441	A3	19710802 <--
US 1973-395146	A3	19730907 <--
US 1976-749402	A3	19761210 <--

ED Entered STN: 12 May 1984

GI For diagram(s), see printed CA Issue.

AB The Et esters of the title acids [I, R1 = H or Pr, R2 = Me, Pr, or Pr, or (R1R2 =) (CH2)4-5] are prepared from esters (II) and sulfones Me2C:CHCH2SO2R3 (R3 = aryl) (III) and tert-BuOK (IV). The acids, as their acid chlorides, are esterified with dl-allethrolone. Thus, III (R3 = Ph) 12.9, II (R1 = H, R2 = Ph) 16.2, IV 13.82 g, and Me2SO 125 cm3 30 min at 20° gave 5.15 g Et ester of I (R1 = H, R2 = Ph) which was hydrolyzed to give I (R1 = H, R2 = Ph), m. 104°. Similarly were prepared Et esters of I (R1 = H, R2 = Me), b0.2 52°, n25D 1.462; I (R1 = R2 = Pr), b0.5 90-2°, n17D 1.4660; and I [(R1R2 =) (CH2)5], b0.7 93-7°. These esters were hydrolyzed to give I (R1 = H, R2 = Me), b0.07 81-2°, n25D 1.4820 (S-benzylthiuronium salt m. 194°), I (R1 = R2 = Pr), b0.1 116°, n23D 1.4760, and I [(R1R2 =) (CH2)5], m. 80° (isooctane); p-bromophenacyl ester m. 85°. I and SOCl2 gave the following acid chlorides I (CO2H = COCl): I (R1 = H, R2 = Ph), b0.3 101-3°, n23D 1.5522; I (R1 = H, R2 = Me), b0.8 51°; I (R1 = R2 = Pr), b0.1 80-5°, n23D 1.4819; I [(R1R2 =) (CH2)5], b0.2 78-80°, n25D 1.5080. The acid chloride of I (R1 = H, R2 = Ph) (1.742 g), 1.1126 g dl-allethrolone, 0.8 cm3 C5H5N, and 10 cm3 C6H6 gave an ester which was passed in C6H6 down an Al2O3 column to give 2.150 g ester, n24D 1.5487. Similarly the dl-allethrolone esters of I (R1 and R2 given) were prepd: H, Me, b0.01 127°; Pr, Pr; (R1 R2 =) (CH2)5, n25D 1.5193.

IT 26069-11-4P

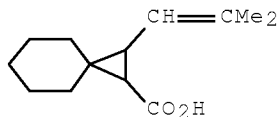


Serial No.:10/691,095

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 26069-11-4 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2-(2-methyl-1-propen-1-yl)- (CA INDEX NAME)



L25 ANSWER 23 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1969:460791 HCAPLUS Full-text

DOCUMENT NUMBER: 71:60791

ORIGINAL REFERENCE NO.: 71:11159a,11162a

TITLE: Synthesis of trans-chrysanthemic acid analogs

AUTHOR(S): Velluz, Leon; Nomine, Gerard; Martel, Jacques

CORPORATE SOURCE: Cent. Rech., Roussel-Uclaf, Romainville, Fr.

SOURCE: Comptes Rendus des Seances de l'Academie des Sciences, Serie C: Sciences Chimiques (1969), 268(25), 2199-203

CODEN: CHDCAQ; ISSN: 0567-6541

DOCUMENT TYPE: Journal

LANGUAGE: French

ED Entered STN: 12 May 1984

GI For diagram(s), see printed CA Issue.

AB trans-Cyclopropanecarboxylic acids I, where R, R1, R2, and R3 are H and alkyl and aryl groups, are prepared from RR1C:CHCO2Et and R2R3C:-CHCH2SO2Ar. The R and R1 (and R2 and R3) can be identical or different; acids I (R = R1 = Me), where CR2R3 is a sym. cycloalkylidene group, are also prepared

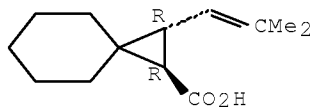
IT 23057-77-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

RN 23057-77-4 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid, 2-(2-methyl-1-propen-1-yl)-, (1R,2R)-rel- (CA INDEX NAME)

Relative stereochemistry.



OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD  
(2 CITINGS)

L25 ANSWER 24 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1969:3337 HCAPLUS Full-text

DOCUMENT NUMBER: 70:3337

ORIGINAL REFERENCE NO.: 70:593a,596a

Serial No.:10/691,095

TITLE: Reactions of sodium cyanide with 1,3-propanediol bistosylates. Influence of the intramolecular distance between the two reactions sites

AUTHOR(S): Seyden-Penne, Jacqueline; Roux-Schmitt, Marie Claude

CORPORATE SOURCE: C.N.R.S., Thiais, Fr.

SOURCE: Bulletin de la Societe Chimique de France ( 1968), (9), 3810-12  
CODEN: BSCFAS; ISSN: 0037-8968

DOCUMENT TYPE: Journal

LANGUAGE: French

ED Entered STN: 12 May 1984

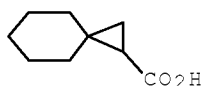
AB The reactions of NaCN with 1,1,-bis(hydroxymethyl)cycloalkanes (the cycloalkane contains 3-6 C) to give mixts. of 3,3-cycloalkyleneglutaronitriles and spiro-alkanecarbonitriles are described. The composition of the reactions product mixts. varies according to the intramol. distance between the 2 reactions sites.

IT 17202-86-7P 17202-88-9P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of)

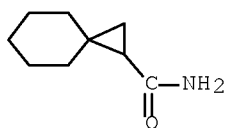
RN 17202-86-7 HCAPLUS

CN Spiro[2.5]octane-1-carboxylic acid (CA INDEX NAME)



RN 17202-88-9 HCAPLUS

CN Spiro[2.5]octane-1-carboxamide (CA INDEX NAME)



L25 ANSWER 25 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1968:505990 HCAPLUS Full-text

DOCUMENT NUMBER: 69:105990

ORIGINAL REFERENCE NO.: 69:19827a,19830a

TITLE: Chemistry of cyclopropanes. I. Synthesis and deamination of spiroamines

AUTHOR(S): Konzelman, L. M.; Conley, R. T.

CORPORATE SOURCE: Seton Hall Univ., South Orange, NJ, USA

SOURCE: Journal of Organic Chemistry (1968), 33(10), 3828-38  
CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

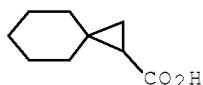
LANGUAGE: English

ED Entered STN: 12 May 1984

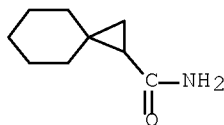
GI For diagram(s), see printed CA Issue.

AB Four spirocyclopropylamines in which the adjacent spiro ring was varied from cyclopropyl to cyclohexyl were prepared and deaminated. 1-Aminospirohexane (I), 1-aminospiro[2.4]heptane (II), and 1-aminospiro[2.5]octane (III) were obtained by adding Et diazoacetate to the appropriate methylenecycloalkane, and converting the resulting spiro esters by hydrolysis and Curtius rearrangement into the corresponding spiro amines. Similarly, spiropentylamine (IV) was prepared from Et spiropentanecarboxylate. Deamination (aqueous HNO<sub>2</sub>-NaNO<sub>2</sub>) of I-III gave mixts. of unsatd. alcs. in which the adjacent cycloalkyl moiety remained intact. IV gave predominantly a mixture of 2- and 3-methylenecyclobutanols. These results are discussed in terms of the collapse or rearrangement of an initially formed spirocyclopropyl action.

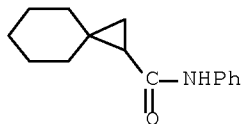
IT 17202-86-7F 17202-88-9F 17202-89-0F  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of)  
 RN 17202-86-7 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid (CA INDEX NAME)



RN 17202-88-9 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide (CA INDEX NAME)



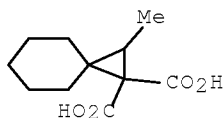
RN 17202-89-0 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxamide, N-phenyl- (CA INDEX NAME)



OS.CITING REF COUNT: 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS RECORD (10 CITINGS)

L25 ANSWER 26 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1965:58590 HCAPLUS Full-text  
 DOCUMENT NUMBER: 62:58590

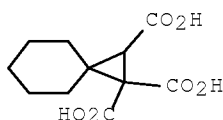
ORIGINAL REFERENCE NO.: 62:10349a-e  
 TITLE: Cyclic acylals. XII. Synthesis of substituted cyclopropane-1,1-dicarboxylic acids  
 AUTHOR(S): Wessely, F.; Eitel, A.  
 CORPORATE SOURCE: Univ. Vienna  
 SOURCE: Monatshefte fuer Chemie (1964), 95(6), 1577-88  
 CODEN: MOCMB7; ISSN: 0026-9247  
 DOCUMENT TYPE: Journal  
 LANGUAGE: German  
 ED Entered STN: 22 Apr 2001  
 GI For diagram(s), see printed CA Issue.  
 AB cf. CA 59, 6300e; 62, 6427e. Reactions of CH<sub>2</sub>N<sub>2</sub> with substituted methylene-Meldrum's acids (I) gave a series of esters of spirocyclopropane-1,1-dicarboxylic acids (II) which were hydrolyzed to the corresponding acids (III). Some of the reactions with CH<sub>2</sub>N<sub>2</sub> gave two products, one of which resulted from a ring expansion. The thin-layer chromatography of I is described. A suspension of I (n = 5) in MeOH was cooled to -70° and treated with CH<sub>2</sub>N<sub>2</sub> in Et<sub>2</sub>O portionwise during 5 hrs. The excess CH<sub>2</sub>N<sub>2</sub> and Et<sub>2</sub>O were removed in vacuo. The residue taken up in Et<sub>2</sub>O, filtered from any polymethylene formed, and then concentrated gave a residue (48%) which showed two m.ps., 93° and 105° (Et<sub>2</sub>O-petr. ether). Purification of this product by thin-layer chromatography gave 60% II (n = 5) and about 10% II (n = 6). A solution of I (n = 4) in MeOH was treated with CH<sub>2</sub>N<sub>2</sub> to give 50% II (n = 5) which m. 93° and then partially solidified and gave another m.p. at 105°. II (n = 5) was hydrolyzed in alc. NaOH to give III (n = 5), m. 151°. Decarboxylation of III (n = 5) at 160-70° gave a lactone (IV),  $\nu$  1785 cm.<sup>-1</sup>; and an acid (V), m. 21-3°; Me ester  $\nu$  1740 cm.<sup>-1</sup> (CCl<sub>4</sub>). Hydrogenation of V in the presence of Pd gave  $\beta$ -cyclohexylpropionic acid, m. 12°; amide m. 118°. I (n = 6), m. 55°, in MeOH was treated with CH<sub>2</sub>N<sub>2</sub> to give II (n = 6), m. 101-3°. Similarly prepared was 2-cyclo-hexylcyclopropane-1,1-dicarboxylic acid, m. 163-6°. The following compds. were also prepared (type, R, R<sub>1</sub>, R<sub>2</sub>, and m.p.given): VI, Me, --, --, 79-80°; VII, Me, --, --, 148°; VI, CO<sub>2</sub>Et, --, --, 101°; VII, CO<sub>2</sub>H, --, --, 191-4°; VIII, Ph, Me, Me, --; VIII, Ph, H, CO<sub>2</sub>Et, 109-10°; VIII, PhCH-(CO<sub>2</sub>Et), H, CO<sub>2</sub>Et, 175°; VIII, Ph, H, Ph, --; VIII, Ph<sub>2</sub>CH, H, Ph, 175°.  
 IT 882-60-0P, Spiro[2.5]octane-1,1-dicarboxylic acid, 2-methyl-  
 944-07-0P, Spiro[2.5]octane-1,1-dicarboxylic acid  
 1021-30-3P, Spiro[2.5]octane-1,1,2-tricarboxylic acid  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 882-60-0 HCAPLUS  
 CN Spiro[2.5]octane-1,1-dicarboxylic acid, 2-methyl- (CA INDEX NAME)



RN 944-07-0 HCAPLUS  
 CN Spiro[2.5]octane-1,1-dicarboxylic acid (CA INDEX NAME)



RN 1021-30-3 HCAPLUS  
 CN Spiro[2.5]octane-1,1,2-tricarboxylic acid (CA INDEX NAME)



L25 ANSWER 27 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1963:403644 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 59:3644

ORIGINAL REFERENCE NO.: 59:666c-g

TITLE: Photochemical isomerization in the  $\beta$ -ionone series

AUTHOR(S): Mousseron-Canet, Magdeleine; Mousseron, Max; Legendre, Pierre; Wylde, James

CORPORATE SOURCE: Ecole Natl. Super Chim. Org., Brussels, Belg.

SOURCE: Bulletin de la Societe Chimique de France (1963) 379-83

CODEN: BSCFAS; ISSN: 0037-8968

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 59:3644

ED Entered STN: 22 Apr 2001

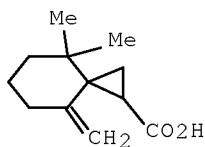
GI For diagram(s), see printed CA Issue.

AB cf. CA 55, 27398b. The primary photochem. isomerization process was a trans  $\rightarrow$  cis transformation; this very reactive intermediate was then converted to a conjugated exocyclic diene. Irradiation of 3 g.  $\beta$ -cyclocitrylideneacetic acid (I) in 300 cc. hexane by a Hg-vapor lamp for 72 hrs. under N gave 800 mg. II and 1 g. III, m. 35-40°; S-benzylisothiuronium salt m. 162-4°. Irradiation of I in CH Cl<sub>3</sub> or EtOH gave II, III, and IV. Irradiation of  $\beta$ -ionone gave V; semicarbazone m. 171-2°. III (1 g.) in 10 cc. anhydrous Et<sub>2</sub>O treated dropwise with stirring with 260 mg. MeLi in Et<sub>2</sub>O under N, and the mixture refluxed 2 hrs. gave 800 mg. V.  $\alpha$ -Cyclocitrylideneacetic acid (200 mg.) (S-benzylisothiuronium salt m. 175°), obtained by the haloform reaction on  $\alpha$ -ionone, on hydrogenation in 15 cc. HOAc with 100 mg. Adams PtO<sub>2</sub> under atmospheric pressure gave VI (S-benzylthiuronium salt m. 165°), which was also obtained by a similar hydrogenation of III. An inconclusive preparation was made of VII (which might hypothetically be expected to be formed in the irradiation) by hydrogenation of IV to VIII, m. 54-5°, transformation of VIII by SOCl<sub>2</sub> into the chloro ester, and dehalogenation by Na tert-amylate. Lactonization of 800 mg. III by 3.55 cc. HCO<sub>2</sub>H for 24 hrs. at room temperature gave chiefly II (with small amts. of IV); in the hot, the product was chiefly IV. A mixture of II and IV treated in the hot with alc. NaOH showed a considerable enrichment in IV. I (5 g.) in 100 cc. Et<sub>2</sub>O treated with CH<sub>2</sub>N<sub>2</sub> in Et<sub>2</sub>O at 0° gave 95% IX, which on irradiation gave X. Saponification of X with

Serial No.:10/691,095

hot alc. KOH gave III. The mechanism of the irradiation reactions is discussed. The structures of many of the products were confirmed by ultraviolet and infrared measurements. The nuclear magnetic resonance spectra of vinylacetic acid, gem-dimethylcyclopropanecarboxylic acid, III, and VI were determined and compared.

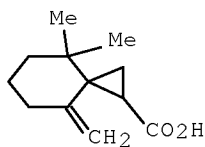
IT 92904-33-1F, Spiro[2.5]octane-1-carboxylic acid,  
4,4-dimethyl-8-methylene- 95696-94-9F,  
Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene-, compound with  
2-benzyl-2-thiopseudourea  
RL: PREP (Preparation)  
(preparation of)  
RN 92904-33-1 HCAPLUS  
CN Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene- (CA INDEX  
NAME)



RN 95696-94-9 HCAPLUS  
CN Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene-, compd. with  
phenylmethyl carbamimidothioate (1:1) (CA INDEX NAME)

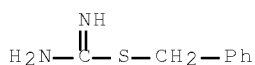
CM 1

CRN 92904-33-1  
CMF C12 H18 O2



CM 2

CRN 621-85-2  
CMF C8 H10 N2 S



OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
(1 CITINGS)

L25 ANSWER 28 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1963:403643 HCAPLUS Full-text

DOCUMENT NUMBER: 59:3643

ORIGINAL REFERENCE NO.: 59:665e-h,666b-c

TITLE: Stereochemical studies in the terpene series. II.  
Structure of the acid obtained by rearrangement of  
pinolic acid in acid mediumAUTHOR(S): Harispe, Marcelle; Mea, Dominique; Horeau, Alain;  
Jacques, Jean

CORPORATE SOURCE: Coll. France, Paris

SOURCE: Bulletin de la Societe Chimique de France (   
1963) 472-5

CODEN: BSCFAS; ISSN: 0037-8968

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

ED Entered STN: 22 Apr 2001

GI For diagram(s), see printed CA Issue.

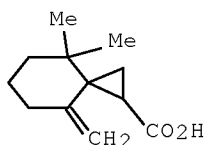
AB cf. CA 57, 15157g. The hydroxy acid previously obtained (loc. cit.) by treatment of (-)-pinolic acid with cold dilute H<sub>2</sub>SO<sub>4</sub> was shown to be I on the basis of the following data. I (2 g.) in 8 cc. HOAc treated with a solution of 0.72 g. CrO<sub>3</sub> in 0.7 cc. water, and the mixture kept overnight gave 1.77 g. II, m. 59° (petr. ether), [ $\alpha$ ]<sub>D</sub> 4° (c 2, dioxane); Na salt, [ $\alpha$ ]<sub>D</sub> 1.3° (c 5, H<sub>2</sub>O). II boiled several min. with 2N alc. KOH isomerized to the cis acid (III), m. 82° (petr. ether), [ $\alpha$ ]<sub>D</sub> 39° (c 2.5, dioxane); Na salt, [ $\alpha$ ]<sub>D</sub> 43° (c 5, H<sub>2</sub>O). In alkaline solution an equilibrium mixture of 90- 92% of the salt of III and of 8-10% of the salt of II was formed. III was identical with the acid obtained in 18% overall yield by oxidation of (+)-fenchone with CrO<sub>3</sub>-HOAc-Ac<sub>2</sub>O at 15° for 1.5 hrs. to form 2,6-dioxofenchane, and by treatment of the latter (2.53 g.) for 1 hr. at 100° with 1.5 g. KOH in 20 cc. absolute alc.; the 2 acids gave identical Me esters, oximes (m. 165°), and semicarbazones, cubic crystals, m. 223° (MeOH). The infrared spectra of the 2 semicarbazones were identical. The assignments of configurations to carbons 1, 3, and 4 of I and to carbons 1 and 4 of II and III were made on the basis of their origin and of the following exptl. data. The method for determination of the configurations of secondary hydroxyls (CA 56, 7384f) by partial esterification with  $\alpha$ -phenylbutyric anhydride when applied to (-)-pinolic acid and I gave the configurations indicated. The configuration of the 4-Me was based on a consideration of the reaction mechanism involved in the formation of I. Formulas II and III were in agreement with the results of hydrogenation expts. III was hydrogenated as the Na salt by Pt-Raney Ni in EtOH to form IV, m. 121.5° (petr. ether), [ $\alpha$ ]<sub>D</sub> 23° (c 3, EtOH); Me ester (by CH<sub>2</sub>N<sub>2</sub> method), n<sub>D</sub> 1.4651. II was not hydrogenated by Adams Pt in HOAc. The configuration of IV was determined by the method of partial esterification. Some of the configurations previously assigned (CA 57, 9883h) are in error.

IT 92904-33-1P, Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene- 95696-94-9P, Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene-, compound with 2-benzyl-2-thiopseudourea

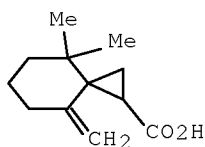
RL: PREP (Preparation)  
(preparation of)

RN 92904-33-1 HCAPLUS

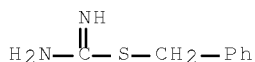
CN Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene- (CA INDEX  
NAME)



RN 95696-94-9 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 4,4-dimethyl-8-methylene-, compd. with phenylmethyl carbamimidothioate (1:1) (CA INDEX NAME)  
 CM 1  
 CRN 92904-33-1  
 CMF C12 H18 O2



CM 2  
 CRN 621-85-2  
 CMF C8 H10 N2 S



OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

L25 ANSWER 29 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1963:8560 HCAPLUS Full-text  
 DOCUMENT NUMBER: 58:8560  
 ORIGINAL REFERENCE NO.: 58:1361g-h,1362a  
 TITLE: A study of the Thorpe-Ingold effect: the reaction of potassium hydroxide with a lactone of ethyl  $\alpha$ -bromo- $\alpha'$ -hydroxy-1,1-cyclohexanediacetate  
 AUTHOR(S): Larson, H. O.; Sung, Gaylien S. K.  
 CORPORATE SOURCE: Univ. Hawaii, Honolulu  
 SOURCE: Australian Journal of Chemistry (1961), 15, 261-4  
 CODEN: AJCHAS; ISSN: 0004-9425  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable



ED Entered STN: 22 Apr 2001

AB  $\alpha,\alpha'$ -Dihydroxy-1,1-cyclohexanediacetic acid (I) was produced in the title reaction and is thought to be the product regarded by Beesley, et al. (CA 9, 3059) as 1-hydroxy-trans-spiro[2,5]octane-1,2-dicarboxylic acid. Bromination of 50 g. 1,1-cyclohexanediacetic acid with PBr<sub>5</sub> and Br (Thole and Thorpe CA 5, 2848) gave 22 g. liquid acid and 74 g. neutral product (II). Treatment of the acid with KOH gave 2.3 g. trans-spiro[2,5]-octanedicarboxylic acid, m. 238-9° (aqueous EtOH),  $\lambda$  5.98  $\mu$  (KBr) (Ettlinger and Kennedy, CA 50, 8472h). Treatment of 54 g. II with pyridine gave 11.1 g. lactone (III) of Et  $\alpha$ -bromo- $\alpha'$ -hydroxy-1,1-cyclohexanediacetate, m. 93.5-4.5° (C<sub>6</sub>H<sub>6</sub>),  $\lambda$  5.62 and 5.73  $\mu$  (KBr). III (3.6 g.) and 3.6 g. KOH in 21 mL. H<sub>2</sub>O at 95-105° 20 min. gave 0.35 g. I, m. 215-17° (aqueous EtOH),  $\lambda$  5.84 and 6.05  $\mu$  (KBr) or 5.74 and 5.82  $\mu$  (dioxane), NMR at 56.4, 64.4, and 1.52 cycles/s. (NaOD). III. (4.0 g.) and 22 g. 64% aqueous KOH at 140-50° 4 min. gave 0.30 g.  $\Delta$ 1- $\alpha$ -cyclohexylideneacetic acid, m. 90-1° (aqueous EtOH),  $\lambda$  5.98 and 6.15  $\mu$  (KBr). The reactions of III are analogous to those of  $\alpha,\alpha'$ -dihydroxy-1,1-cyclopentanediacetic acid lactone (Becker and T., CA 15, 1018).

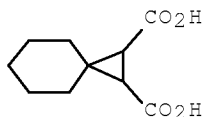
IT 90927-27-8P, Spiro[2.5]octane-1,2-dicarboxylic acid

RL: PREP (Preparation)

(preparation of)

RN 90927-27-8 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid (CA INDEX NAME)



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ACCESSION NUMBER: 1962:456434 HCAPLUS Full-text

DOCUMENT NUMBER: 57:56434

ORIGINAL REFERENCE NO.: 57:11242a-i,11243a-i,11244a-f

TITLE: Polyterpenes. IV. Oxidation products of thujopsene

AUTHOR(S): Nagahama, Shizuo; Kobayashi, Hiroshi; Akiyoshi, Saburo

CORPORATE SOURCE: Kyushu Univ., Fukuoka

SOURCE: Bulletin of the Chemical Society of Japan (

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GI For diagram(s), see printed CA Issue.

AB cf. *ibid.* 34, 1123(1961); CA 55, 2728c. Thujopsene (I) (shown to have structure Ia by Erdtman and Norin, CA 54, 24845e; Norin, CA 57, 7317d) gave a number of degradation products (CA 52, 10964a) on KMnO<sub>4</sub> oxidation (in the present study on K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> oxidation) for which structural assignments were now made on the basis of the structure of I. I (100 g.) in 400 cc. ice-cold Me<sub>2</sub>CO oxidized with 250 g. finely powdered KMnO<sub>4</sub> gave an oily or semisolid acid fraction, C<sub>15</sub>H<sub>22</sub>O<sub>4</sub>, which was treated with C<sub>6</sub>H<sub>6</sub> [an acid (II) precipitated if it had been formed] and the C<sub>6</sub>H<sub>6</sub> extract concentrated and cooled to give 10 g. oxo acid (III), C<sub>15</sub>H<sub>24</sub>O<sub>3</sub>, m. 165°, [ $\alpha$ ]<sub>D</sub> -120°; the mother liquor diluted with petr. ether and kept several weeks in a refrigerator gave an oxo acid (IV) and an oxo acid (IV); after collecting a 2nd and 3rd crop, the remaining IV was

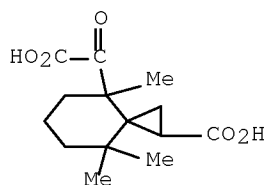
converted to II, which was easily separated by treatment with alkali for 2-3 days. II, C<sub>15</sub>H<sub>22</sub>O<sub>4</sub>, m. 193° (decomposition), [ $\alpha$ ]<sub>D</sub> 21.6°, 4.5 g. obtained on KMnO<sub>4</sub> oxidation of 100 g. I; IV, C<sub>15</sub>H<sub>22</sub>O<sub>4</sub>, m. 124°, [ $\alpha$ ]<sub>D</sub> -28.0°, 3.5 g. obtained from KMnO<sub>4</sub> oxidation of 100 g. I; V, C<sub>14</sub>H<sub>22</sub>O<sub>3</sub>, m. 156°, [ $\alpha$ ]<sub>D</sub> -85.5°, 0.3 g. obtained from KMnO<sub>4</sub> oxidation of 100 g. I. The neutral fraction (750 g., from several combined runs) fractionated in vacuo gave the following fractions: (1) 28.4% fraction, mainly unreacted I, containing a small amount of isomerized hydrocarbons, b<sub>11</sub> .apprx.119-°, n<sub>23D</sub> 1.5030-1.5050, (2) 5.9% fraction, b<sub>11</sub> 119-30°, n<sub>23D</sub> 1.5057-1.5090, which was redistd., the fraction of maximum n<sub>D</sub> (1.6%, b<sub>6</sub> 95-100°, n<sub>23D</sub> 1.5097) chromatographed on Al<sub>2</sub>O<sub>3</sub>, and eluted with petr. ether to give 0.9% hydrocarbon, n<sub>30D</sub> 1.5111, d<sub>30</sub> 0.9245, [ $\alpha$ ]<sub>30D</sub> 40.4°, v 1515 and 812 cm.<sup>-1</sup> (further elution with C<sub>6</sub>H<sub>6</sub> gave VI); (3) 5.8% fraction, b<sub>11</sub> 130-43°, n<sub>23D</sub> 1.5018-1.5030), which was redistd., the fraction of min. n<sub>D</sub> (1.5%, b<sub>20</sub> 125°, n<sub>23D</sub> 1.4987) chromatographed on Al<sub>2</sub>O<sub>3</sub>, and eluted with petr. ether to give a mixture of ketones [1 of these separated as semicarbazone, m. 205-6° (decomposition); from the mother liquor was obtained another impure semicarbazone, m. 201.5-2.5° (decomposition)] (further elution gave VI; C<sub>6</sub>H<sub>6</sub> elution gave cedrol, m. 85.5-6.0°; elution with EtOAc followed by dilution of the eluate with petr. ether and cooling gave a ketone, C<sub>15</sub>H<sub>24</sub>O<sub>2</sub>, m. 116-17.5° (petr. ether), v 3330 and 1740 cm.<sup>-1</sup>); (4) 18.2% fraction, b<sub>10</sub> 143-65°, n<sub>20D</sub> 1.5060-1.5100, which was chromatographed on Al<sub>2</sub>O<sub>3</sub> and eluted to give (from a petr. ether-C<sub>6</sub>H<sub>6</sub> eluate) 0.4% VII, (from an EtOAc eluate) 0.5% hydroxy ketone (VIII), C<sub>15</sub>H<sub>24</sub>O<sub>2</sub>, m. 68-70.5°, v (Nujol) 3384, 3195, and 1702 cm.<sup>-1</sup> [semicarbazone m. 214° (decomposition)], and (from an MeOH eluate) 1.4% lactone, C<sub>15</sub>H<sub>22</sub>O<sub>3</sub>, m. 81.5-2.5°, v 1795 cm.<sup>-1</sup>; (5) 3.3% fraction, b<sub>10</sub> 165-80°, n<sub>15D</sub> 1.5178, which gave only 0.7% VII on similar treatment. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> (250 g.) in 750 g. AcOH added dropwise during 9 hrs. to 100 g. in 200 g. AcOH at 50-70° with stirring, the solution kept overnight, concentrated (250 g. AcOH removed), poured into 3 l. H<sub>2</sub>O, the product extracted with C<sub>6</sub>H<sub>6</sub>, separated into its acidic constituents, and this fraction treated as above gave 0.2 g. III, 0.4 g. II, 2.0 g. IV, and 4.0 g. V; the neutral fraction concentrated and distilled in vacuo gave 28 g. fraction, b<sub>11</sub> 140-6°, which deposited 4.1 g. VII (chromatography of the mother liquor gave 4.0 g. VII and 0.2 g. VIII). IV (280 mg.) in 15 cc. Me<sub>2</sub>CO treated with 420 mg. KMnO<sub>4</sub> in 40 cc. Me<sub>2</sub>CO below 50° gave V, m. 154.5-6.0° (C<sub>6</sub>H<sub>6</sub>-petr. ether or EtOH-H<sub>2</sub>O). V (270 mg.) in 5 cc. AcOH treated with 500 mg. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in 5 cc. AcOH, kept overnight (no color change observed), treated with 5 cc. dilute H<sub>2</sub>SO<sub>4</sub>, kept 2 days, the excess Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> decomposed with EtOH, the mixture diluted with H<sub>2</sub>O, the product isolated with Et<sub>2</sub>O, and triturated with C<sub>6</sub>H<sub>6</sub> gave 45 mg. IX, m. 183-5° (decomposition); from the C<sub>6</sub>H<sub>6</sub> solution was isolated unchanged V. V (500 mg.) oxidized with a hypobromite solution gave 400 mg. CBr<sub>4</sub>; workup of the acid products gave 100 mg. IX. Treatment of IV with CH<sub>2</sub>N<sub>2</sub> gave the Me ester of III, m. 85-7° (petr. ether), [ $\alpha$ ]<sub>17D</sub> -187° (c 0.593, EtOH), its infrared and ultraviolet spectra being consistent with structure X. In the solid state, IV appeared to exist as a lactone (v 1761 cm.<sup>-1</sup>) and was therefore assigned structure XI. IV in 5% aqueous NaOH kept overnight at room temperature and acidified gave II. EtOH or Et<sub>2</sub>O solns. of IV containing HCl gave only unchanged IV. The unsatd. oxo acid XII was obtained by dehydration of II (loc. cit.). XII (2.55 g.), 2 cc. N<sub>2</sub>H<sub>4</sub>.H<sub>2</sub>O (XIII), 2.5 g. KOH, and 25 cc. O(CH<sub>2</sub>CH<sub>2</sub>OH)<sub>2</sub> (XIV) refluxed 4 hrs., diluted with H<sub>2</sub>O, and acidified gave 1.54 g. XV, m. 171-2° (EtOH), [ $\alpha$ ]<sub>30D</sub> -21.2° (c 1.19, CHCl<sub>3</sub>). To 186 mg. XV in 4 cc. 3% aqueous KOH was added 10 cc. 2% aqueous KMnO<sub>4</sub>, stirred 1.5 hrs., acidified, and treated with NaHSO<sub>3</sub> gave XII, m. 206° (EtOH-H<sub>2</sub>O). Hinokiic acid (XVI) (2.4 g.) in 20 cc. Me<sub>2</sub>CO treated 1.5 hrs. with 5.0 g. KMnO<sub>4</sub> in Me<sub>2</sub>CO, evaporated, the residue extracted with Et<sub>2</sub>O, the Et<sub>2</sub>O solution extracted with aqueous NaHCO<sub>3</sub>, and evaporated gave 120 mg. XVII; the aqueous NaHCO<sub>3</sub> extract yielded 200 mg. crude XVIII, m. 206-11° [the mother liquor treated with CH<sub>2</sub>N<sub>2</sub>, the product (1.3 g.) chromatographed on Al<sub>2</sub>O<sub>3</sub>, and eluted

with 1:1 petr. ether-C<sub>6</sub>H<sub>6</sub> gave 165 mg. di-Me ester of IX]. XVI (1.05 g.), 1.05 g. Cu powder, and 10 cc. quinoline heated 2 hrs. at 230-50°, filtered, the filtrate combined with distillate, diluted with Et<sub>2</sub>O, the solution washed with aqueous HCl, aqueous NaHCO<sub>3</sub>, and H<sub>2</sub>O, dried, evaporated, and the residual solid (320 mg.) distilled in vacuo gave XIX, m. 47° (MeOH), [ $\alpha$ ]<sub>D</sub><sup>20</sup> -135° (c 0.933, EtOH.) Similar treatment of 1 g. XV gave XX, m. 12-14°, n<sub>D</sub><sup>20</sup> 1.5042, [ $\alpha$ ]<sub>D</sub><sup>20</sup> -114° (c 0.957, EtOH). Similar treatment of XII gave VII. VII (5 g.) treated with 3.3 cc. XIII, 4.8 g. KOH, and 50 cc. XIV and the resulting waxy product recrystd. several times from MeOH (with cooling in a dry ice-MeOH bath) gave 2.85 g. mixture of XIX and XX, m. 33-5°. To 550 mg. XIX in 10 cc. Me<sub>2</sub>CO was added 2 g. KMnO<sub>4</sub> in 50 cc. Me<sub>2</sub>CO, the mixture stirred 1.5 hrs. below 40°, kept overnight, and worked up as usual to give 60 mg. XVIII, m. 210-11.5° (EtOH-H<sub>2</sub>O). Similar oxidation of 710 mg. XX gave 170 mg. IX. Alkaline KMnO<sub>4</sub> oxidation of 290 mg. XII in the usual way gave (from the neutral fraction) 76 mg. XVII, m. 211-12° (petr. ether). KMnO<sub>4</sub> (4.27 g.) in 100 cc. H<sub>2</sub>O added to VII, the mixture stirred 2.5 hrs. below 70°, and worked up as usual gave (from the acid fraction) 90 mg. IX and (from the neutral fraction) 165 mg. XVII, m. 206-7°. To 30 g. II in 450 cc. AcOH (incomplete solution) was added 12 g. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in 50 cc. AcOH, the mixture kept 1 week at room temperature, the precipitate [7.84 g. II, m. 205.5-7.0° (decomposition)] filtered off, the filtrate concentrated to 1/3 its volume, poured into 1 l. H<sub>2</sub>O, the precipitate filtered off, and triturated with hot C<sub>6</sub>H<sub>6</sub> to give 4.0 g. XXI, m. 218-21° (EtOH), [ $\alpha$ ]<sub>D</sub><sup>20</sup> 272° (c 0.93, EtOH); the C<sub>6</sub>H<sub>6</sub> solution extracted with aqueous NaHCO<sub>3</sub> and evaporated gave a mixture of XII and XVII; acidification of the alkaline extract gave 440 mg. IX. With a ratio of 20 g. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>/15 g. II the yield of XXI was diminished, but a larger amount (8 g.) of a mixture of XII and XVII was obtained. XXI (1.34 g.) in 40 cc. AcOH treated with 1.75 g. Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in 10 cc. AcOH, the mixture kept 5 hrs. below 50°, concentrated to 1/2 volume, diluted with H<sub>2</sub>O, the precipitate dissolved in C<sub>6</sub>H<sub>6</sub>, the solution freed from acids, and evaporated gave 960 mg. XXII, m. 179.5-80.0° (chromatography on Al<sub>2</sub>O<sub>3</sub>), mixed m.p. [with XXII prepared from VI, Kobayashi, et al., *ibid.* 34, 1123(1961)] 181-2.5°. IV was therefore assigned structure XXIII. Treatment of V with CH<sub>2</sub>N<sub>2</sub> gave the Me ester (XXIV), m. 69-71°, [ $\alpha$ ]<sub>D</sub><sup>20</sup> -211° (c 0.78, EtOH). XXIV (140 mg.) refluxed 2 hrs. with 5% MeOH-NaOH, the solution poured into H<sub>2</sub>O, acidified, the product triturated with petr. ether, and recrystd. from Et-OH-H<sub>2</sub>O gave (from 1st crop) 5 mg. XXI, m. 219-20° (decomposition), and (from a 2nd crop) V. Treatment of V with Ac<sub>2</sub>O in pyridine gave XXV, m. 80.5-3.0° (EtOH). XXV (46 mg.) refluxed 1 hr. in 5 cc. 5% aqueous NaOH gave 12 mg. V. XXV (85 mg.) in MeOH-KOH refluxed 2 hrs., concentrated to 1/2 volume, poured into H<sub>2</sub>O, and the precipitate purified gave XXIV; acidification of the filtrate gave a small amount of XXI. V on the basis of spectral evidence and the preceding expts. existed as a pseudo acid and was assigned structure XXVI. IV (680 mg.) added to 20 cc. aqueous NaOBr, kept 2.5 hrs., treated with NaHSO<sub>3</sub> and aqueous HCl, the resulting gel extracted with Et<sub>2</sub>O, and the extract evaporated gave XXVII (R = R' = H), m. 178-80° (decomposition),  $\nu$  3378, 1745, and 1667 cm.<sup>-1</sup> Alternatively, the gel-product was treated overnight with alkaline H<sub>2</sub>O<sub>2</sub>, acidified, the precipitate dissolved in MeOH-H<sub>2</sub>O, and the solution deposited an oil, which solidified,  $\nu$  (Nujol) 3333, 1727, and 1675 cm.<sup>-1</sup>, and then XXVII (R = R' = H), m. 178-80°,  $\nu$  3408, 3155, and 1721 cm.<sup>-1</sup>; with CH<sub>2</sub>N<sub>2</sub> both products gave the same di-Me ester [XXVII (R = R' = Me)], m. 80.5-2.5°, which was identical with the di-Me ester obtained from the gel without treatment with H<sub>2</sub>O<sub>2</sub>. The different infrared spectra of the several samples of XXVII (R = R' = H) was attributed to the presence of varying proportions of XXVIII (R = H). XII (1.1 g.) ozonolyzed 3 hrs. in 80 cc. 1:1 CCl<sub>4</sub>-CHCl<sub>3</sub> with ice bath cooling, the solvent removed, the residue taken up in Et<sub>2</sub>O, and the acidic fraction extracted from the solution gave XXVIII (R = H). XXVIII (R = H) (90 mg.) in 3 cc. AcOH treated with 200 mg. CrO<sub>3</sub> in 3 drops concentrated H<sub>2</sub>SO<sub>4</sub>, kept 24 hrs., and diluted with H<sub>2</sub>O gave 20 mg. XVII, m. 208°. X (500 mg.) in 2 cc. AcOH treated with 2.0 g.

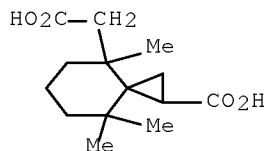
Serial No.:10/691,095

Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in 3 cc. AcOH followed by 4 drops concentrated H<sub>2</sub>SO<sub>4</sub> and kept a few min. gave XXVIII (R = Me), m. 188-90° (C<sub>6</sub>H<sub>6</sub>-petr. ether, then sublimation in vacuo). XXVII (R = R' = Me) treated 1.5 hrs. with CrO<sub>2</sub> in AcOH-H<sub>2</sub>SO<sub>4</sub>, diluted with H<sub>2</sub>O, and the precipitate filtered off gave crude XXVII (R = R' = Me), which contained a small amount petr. ether-insol. XXVIII (R = Me), m. 187-90° (C<sub>6</sub>H<sub>6</sub>).

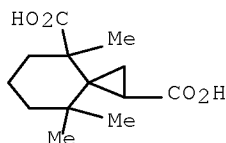
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105912-69-4P, Spiro[2.5]octane-1,4-dicarboxylic acid,  
4,8,8-trimethyl-  
RL: PREP (Preparation)  
(preparation of)  
RN 93536-38-0 HCAPLUS  
CN Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl- $\alpha$ -oxo-  
(CA INDEX NAME)



RN 93865-03-3 HCAPLUS  
CN Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl- (CA INDEX NAME)



RN 105912-69-4 HCAPLUS  
CN Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl- (CA INDEX NAME)



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ACCESSION NUMBER: 1962:436487 HCAPLUS [Full-text](#)  
DOCUMENT NUMBER: 57:36487

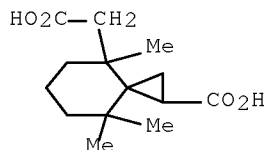
ORIGINAL REFERENCE NO.: 57:7317d-i, 7318a-i, 7319a-d  
 TITLE: The chemistry of the natural order cupressales. XL.  
 The structure of thujopsene and hinokiic acid  
 AUTHOR(S): Norin, Torbjorn  
 CORPORATE SOURCE: Kungl. Tek. Hogskolan, Stockholm  
 SOURCE: Acta Chemica Scandinavica (1961), 15,  
 1676-94  
 CODEN: ACHSE7; ISSN: 0904-213X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 ED Entered STN: 22 Apr 2001  
 GI For diagram(s), see printed CA Issue.  
 AB cf. CA 54, 24845e; 56, 6814a; 57, 3676a. Conclusive evidence is presented to establish the structures for thujopsene and hinokiic acid as I (R = Me and CO<sub>2</sub>H) (Ia and Ib, resp.), which, on catalytic hydrogenation, form the corresponding dihydro compds. (II) (R = Me and CO<sub>2</sub>H) (IIa and IIb, resp.) by conjugate addition of H. Proton magnetic resonance data had earlier confirmed the structures. Distillation of the neutral fraction of Japanese "hiba oil" gave Ia, b<sub>10</sub> 120°, [ $\alpha$ ]<sub>D</sub> -110° (C 2.0) (all rotations in CHCl<sub>3</sub> unless otherwise stated), n<sub>D</sub><sup>25</sup> 1.5031, d<sub>4</sub> 0.932. An acidic fraction (10 g.) from several Widdringtonia species was fractionally crystallized from Et<sub>2</sub>O and the more soluble material gave 0.5 g. Ib on recrystn. from Et<sub>2</sub>O-petr. ether (b. 40-60°) and then from MeOH, m. 169-70°, [ $\alpha$ ]<sub>D</sub> -86° (c 1.8). Recrystn. of the mother liquor residue from several solvents gave 4 g. of constant-melting material (m. 137-9°) which was chromatographed on silica gel with CHCl<sub>3</sub>-MeOH to give 3 g. Ib and 1 g. cuparenic acid, m. 158-60°, [ $\alpha$ ]<sub>D</sub> 63° (c 2.0). Oxidation of Ia with SeO<sub>2</sub> gave I (R = CHO) (thujopsenal), m. 75-6°, [ $\alpha$ ]<sub>D</sub> -27° (c 1.9), which on Ag<sub>2</sub>O oxidation gave Ib. Ia (15 g.) in 200 ml. 6:1 EtOAc-MeOH was ozonized at -70° until a blue color appeared, the solution treated with N to remove excess O<sub>3</sub> and the color, the mixture allowed to come to room temperature and treated, portionwise, with 30 g. Zn dust (activated with HOAc) to produce a vigorous reaction causing the mixture to boil. After 1 hr. the reaction was complete and 200 ml. Et<sub>2</sub>O was added, followed by 200 ml. 1% H<sub>2</sub>SO<sub>4</sub>, the mixture filtered, the Zn residue washed with Et<sub>2</sub>O, the organic phase separated, the H<sub>2</sub>O layer extracted with Et<sub>2</sub>O, the combined Et<sub>2</sub>O exts. washed with H<sub>2</sub>O, dried, evaporated, and the residue re-crystallized from EtOAc to give 11.5 g. crystalline 1-acetyl-4,4,8-trimethylspiro[2.5]octane-8-acetic acid (III), m. 166-8°, [ $\alpha$ ]<sub>D</sub> -129° (c 2.0); semicarbazone m. 220° (decomposition); 2,4-dinitrophenylhydrazone m. 153-4°. The mother liquors yielded 1 g. addnl. III and 0.6 g. 1-hydroxyacetyl-4,4,8-trimethylspiro[2.5]octane-8-acetic acid (IV), m. 193° (decomposition). III (250 mg.) in 2 ml. MeOH and 0.5 ml. 105% NaOH was added to 300 mg. KBH<sub>4</sub> in 2 ml. MeOH and 4 ml. H<sub>2</sub>O, the mixture acidified, diluted with H<sub>2</sub>O till cloudy, warmed, the clear solution cooled to crystallize the product which was sublimed to give the lactone of 1-(1-hydroxyethyl)-4,4,8-trimethylspiro[2.5]octane-8-acetic acid, m. 125-7°. III (5 g.) was dissolved in 50 ml. 10% NaOH and excess NaOBr solution (prepared from 25 g. NaOH, 400 ml. H<sub>2</sub>O and 9 ml. Br) at ice-bath temperature, the mixture kept 3 hrs. at room temperature and washed with Et<sub>2</sub>O, the solution decolorized with NaHSO<sub>3</sub>, acidified, extracted with Et<sub>2</sub>O, the Et<sub>2</sub>O extract washed with H<sub>2</sub>O and evaporated, and the residue recrystd. from EtOAc to give 4.5 g. 1-carboxy-4,4,8-trimethylspiro[2.5]octane-8-acetic acid (V), m. 215°, [ $\alpha$ ]<sub>D</sub> -57° (c 1.7). V was also obtained by hypiodite oxidation of IV. V was converted into its anhydride by refluxing in Ac<sub>2</sub>O, m. 113° [CHCl<sub>3</sub> petroleum ether (b. 40-60°)], [ $\alpha$ ]<sub>D</sub> 39° (c 2.4), and to its dimethyl ester (VI) with CH<sub>2</sub>N<sub>2</sub>, m. 71-3° (MeOH-H<sub>2</sub>O and sublimation), [ $\alpha$ ]<sub>D</sub> -59° (c 1.7). VI (2.82 g.), 30 ml. dry C<sub>6</sub>H<sub>6</sub>, and 0.54 g. NaOMe was refluxed 3 hrs. under N, cooled, poured into an ice-cooled mixture of 30 ml. Et<sub>2</sub>O and 60 ml. H<sub>2</sub>O, the layers separated, the H<sub>2</sub>O layer extracted with Et<sub>2</sub>O and acidified to give a low yield of V mono-Me ester (Va), m. 115-16° (MeOH-H<sub>2</sub>O). The combined organic extract was evaporated, the oily

residue refluxed 2 hrs. in 20 ml. MeOH and 10 ml. 10% NaOH, the mixture cooled, diluted with H<sub>2</sub>O, acidified, extracted with Et<sub>2</sub>O, the Et<sub>2</sub>O extract evaporated and the oily residue distilled in vacuo to give 1.72 g. crystalline VII (R = H<sub>2</sub>) (VIIa). Recrystn. from MeOH-H<sub>2</sub>O and sublimation in vacuo gave pure VIIa, m. 119-21° (sealed tube) (the crystals became isotropic at 49-50°), [α]<sub>D</sub> 65°; 2,4-dinitrophenylhydrazone m. 215-17°; semicarbazone m. 225-6° (decomposition). Ib was esterified with CH<sub>2</sub>N<sub>2</sub> and the ester reduced with LiAlH<sub>4</sub> to produce I (R = CH<sub>2</sub>OH) (VIII), m. 103-4° (petr. ether), [α]<sub>D</sub> 102°. VIII (0.3 g.) was ozonized to give 0.21 g. IV, m. 190-3° (decomposition) (Et<sub>2</sub>O-EtOAc). Ozonization of Ib followed by hypobromite oxidation gave VII (R = Br<sub>2</sub>) (IX), m. 99-100° (MeOH-H<sub>2</sub>O), [α]<sub>D</sub> 87deg; V, and Va. IX (0.16 g.), 3 ml. HOAc, 1.0 g. Zn dust, and 0.5 g. NaOAc was refluxed 1 hr., filtered, the residue washed with Et<sub>2</sub>O, the filtrate washed with H<sub>2</sub>O and aqueous NaHCO<sub>3</sub>, dried, and evaporated to give 0.08 g. VIIa. VIIa was converted to IX, with Br in CCl<sub>3</sub>. IX failed to undergo dehydrobromination with LiBr in HCONMe<sub>2</sub> or with collidine. VIIa (0.38 g.), 5 ml. HOAc, and 0.4 g. SeO<sub>2</sub> was refluxed 1 hr., filtered to remove Se, the Se washed with Et<sub>2</sub>O, and the Et<sub>2</sub>O solution washed, dried and evaporated to give 0.4 g. orange oil which was chromatographed on Al<sub>2</sub>O<sub>3</sub> to yield 0.15 g. VIIa and 0.17 g. VII (X = O) (X), m. (after sublimation in vacuo) 177° (sealed tube). X (0.15 g.) in 5 ml. MeOH and 5 ml. 10% KOH-MeOH was cooled (ice-bath), treated with 2 ml. 30% H<sub>2</sub>O<sub>2</sub>, stored overnight at 0°, refluxed 10 min., cooled, diluted with 20 ml. H<sub>2</sub>O to dissolve the white solid, acidified, extracted with Et<sub>2</sub>O, the Et<sub>2</sub>O extract dried and evaporated to give a solid which, after sublimation gave 0.14 g. crystalline anhydride (XI) of 1,8-dicarboxy-4,4,8-trimethylspiro[2.5]octane (XIa), m. 211-13° (sealed tube) (isotropic at 92-3°). XI was not hydrolyzed by rapid recrystn. from HOAc-H<sub>2</sub>O or recrystn. from MeOH-H<sub>2</sub>O. Slow crystallization of XI from HOAc-H<sub>2</sub>O gave crystalline XIa, m. 180° to an oil which resolidified to XI. Reduction of 0.5 g. VIIa in 6 ml. MeOH with 0.9 g. KBH<sub>4</sub> in 15 ml. H<sub>2</sub>O and 6 ml. MeOH gave 0.425 g. XII (R = H) (XIIa), m. 133-5° (MeOH-H<sub>2</sub>O) (isotropic at 87°). VIIa (0.73 g.) with MeMgI gave 0.75 g. XII (R = Me) (XIII), m. 62-3° (MeOH-H<sub>2</sub>O). Se dehydrogenation of XIIa and XIII at 280-90° for 24 hrs. in CO<sub>2</sub> atmospheric gave α-methyl- and 1,6-dimethylnaphthalene, resp., and tetrahydro compds. which, upon ozonization followed by H<sub>2</sub>O<sub>2</sub> oxidation, produced α,α-dimethyladipic acid. Ia (4.04 g.) in 30 ml. MeOH and 3 ml. Et<sub>2</sub>O was hydrogenated over 10% Pd-C till 1 equivalent H had been absorbed, the mixture filtered, diluted with H<sub>2</sub>O, extracted with Et<sub>2</sub>O, and the Et<sub>2</sub>O extract dried and evaporated to give dihydrothujopsene (IIa), [α]<sub>D</sub> 24°, n<sub>25D</sub> 1.5100. Further hydrogenation proceeded at a slower rate to give tetrahydrothujopsene, [α]<sub>D</sub> 27°, n<sub>25D</sub> 1.4922. Ib (0.469 g.) in 30 ml. MeOH was hydrogenated over 10% Pd-C to give dihydrohinokiic acid (IIb), m. 158-60° (MeOH and sublimation), [α]<sub>D</sub> 75°. Hydrogenation of Ib with Pt-AcOH gave tetrahydrohinokic acid, m. 144-6° (MeOH), [α]<sub>D</sub> 60°. Ozonization of 4 g. IIa gave 3.1 g. 6-(2-oxobutyl)-1,2,2,6-tetramethylcyclohexanecarboxylic acid (XIV), m. 160-1° (EtOAc), [α]<sub>D</sub> 71°, which on hypobromite oxidation gave 2.2 g. 6-(2-carboxyethyl)-1,2,2,6-tetramethylcyclohexanecarboxylic acid (XIVa), m. 185-7° (MeCN), [α]<sub>D</sub> -10°. IIb (0.5 g.) was ozonized to 0.31 g. aldehyde acid, m. 111-13.5° (MeOH-H<sub>2</sub>O), which on Ag<sub>2</sub>O oxidation also gave XIVa. Dieckmann condensation of 1.42 g. of the di-Me ester of XIVa by refluxing 3 hrs. with 1 equivalent Nail in 20 ml. C<sub>6</sub>H<sub>6</sub> gave 0.805 g. 3a,7,7,7a-tetramethylhexahydro-1-indanone (XV), m. 202° (sealed tube; crystals were isotropic at room a temperature), [α]<sub>D</sub> 82°. Attempts to prepare the 2,4-dinitrophenyl-hydrazone of XV failed. Quant. bromination expts. showed XV to contain only 2 α-H atoms and gave a dibromo ketone, m. 119-20°. Deuterium exchange also showed 2 α-H atoms in XV. XV (100 mg.), 60 mg. KOD, 2.5 ml. D<sub>2</sub>O and 6 ml. dioxane was refluxed 30 min. under N, the mixture concentrated to 1/2 volume, cooled, extracted with petr. ether, the organic phase washed with D<sub>2</sub>O, dried, evaporated, and the crystalline residue (80 mg.) sublimed to give the α,α-dideuterio derivative of XV, m. 202°

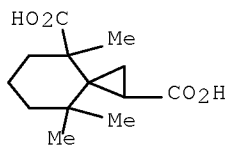
Serial No.:10/691,095

(sealed tube). SeO<sub>2</sub> oxidation of 0.3 g. XV gave 0.13 g. of the diketene, m. 125-6° (MeOH), which (0.1 g.) on oxidation with 2 ml. 30% H<sub>2</sub>O<sub>2</sub> in 10 ml. 50% KOH-MeOH gave 0.7 g. 6-carboxymethyl-1,2,2,6-tetramethylcyclohexanecarboxylic acid (XVI), m. 225-7° (decomposition) (MeOH-H<sub>2</sub>O), which on heating to the m.p. lost H<sub>2</sub>O and produced the anhydride of XVI, m. 216-18° (sealed tube; crystals be-came isotropic at 64°). Ia (0.741 g.) in 8 ml. MeOD and 2 ml. Et<sub>2</sub>O was deuteriated over 10% Pd-C (saturated with D) until 1 equivalent D had been taken up to give dideuterothujopsene (XVII), [α]<sub>D</sub> 22°, n<sub>D</sub><sup>25</sup> 1.5013. Ozonization of XVII gave dideuterio derivative of XIV, m. 159-60°, which on OBr-oxidation gave the dideuterio derivative (XVIII) of XIVa, m. 185-7°. The di-Me ester of XVIII showed a decrease in intensity of the IR band at 1380 cm.<sup>-1</sup> compared with that of the di-Me ester of XIVa. This proved that a new methyl group had been formed during hydrogenation of Ia. Ultraviolet and infrared data were given for the products.

IT ~~93865-03-3P~~, Spiro[2.5]octane-4-acetic acid,  
1-carboxy-4,8,8-trimethyl- ~~105912-69-4P~~,  
Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl-  
RL: PREP (Preparation)  
(preparation of)  
RN 93865-03-3 HCAPLUS  
CN Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl- (CA INDEX NAME)



RN 105912-69-4 HCAPLUS  
CN Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl- (CA INDEX NAME)



OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD  
(5 CITINGS)

L25 ANSWER 32 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 1961:118650 HCAPLUS Full-text  
DOCUMENT NUMBER: 55:118650  
ORIGINAL REFERENCE NO.: 55:22362e-i,22363a-c  
TITLE: Structure of thujopsene  
AUTHOR(S): Nozoe, Tetsuo; Takeshita, Hitoshi; Ito, Sho; Ozeki,  
Takao; Seto, Shuichi  
CORPORATE SOURCE: Tohoku Univ., Sendai  
SOURCE: Chemical & Pharmaceutical Bulletin (1960),  
8, 936-8

DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

ED Entered STN: 22 Apr 2001

GI For diagram(s), see printed CA Issue.

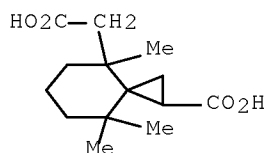
AB Exptl. evidence was summarized in support of the structure B (Erdtman and Norin, CA 54, 24845e) versus A (Kobayashi, et al., CA 54, 2403c) for thujopsene (I). Ozonolysis of I gave the oxo acid (II), m. 164°; 2,4-dinitrophenylhydrazone (III) m. 197°. II treated with acid at 0° gave the oxo- $\gamma$ -lactone (IV), m. 56°; 2,4-dinitrophenylhydrazone (V) m. 164°. Hypobromite oxidation of II gave the dicarboxylic acid (VI), m. 212°, which had 2 isomeric monomethyl esters, m. 59-60° and 114-15°, formed, resp., by mild esterification of VI and partial hydrolysis of the dimethyl ester of VI, m. 73°. Permanganate oxidation of I gave both II and the lactol-ketal (VII), m. 123°. CH<sub>2</sub>N<sub>2</sub> with VII gave the Me ester (VIII) of a diketo acid, m. 89°, whereas alkaline treatment of VII gave the hydroxyoxocarboxylic acid (IX), m. 212°, which was dehydrated and decarboxylated to the unsatd. ketone (X), m. 75°; 2,4-dinitrophenylhydrazone (XI) m. 173-4° and 177-8°, 2 compds. with the same ultraviolet spectrum. Catalytic hydrogenation of X gave the corresponding saturated ketone (XII), m. 105°; [ $\alpha$ ]306 4890°; 2,4-dinitrophenylhydrazone (XIII) m. 187°. Ozonolysis of X gave the nordicarboxylic acid (XIV), m. 212°, also formed from VI through its cyclic ketone (XV), m. 120°, [ $\alpha$ ]302 7030°. Ultraviolet absorption data were, listed for II-V, X-XIII, and XV, and infrared data for II, IV, VII, VIII, X, XII, and XV. All evidence led to acceptance of the structure B for I.

IT 93865-03-3P, Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl-, methyl esters 105912-69-4P, Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl-

RL: PREP (Preparation)  
 (preparation of)

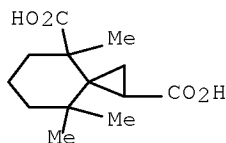
RN 93865-03-3 HCAPLUS

CN Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl- (CA INDEX NAME)



RN 105912-69-4 HCAPLUS

CN Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl- (CA INDEX NAME)



OS.CITING REF COUNT: 3

THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD  
 (3 CITINGS)



L25 ANSWER 33 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1960:129301 HCAPLUS Full-text

DOCUMENT NUMBER: 54:129301

ORIGINAL REFERENCE NO.: 54:24845d-i,24846a-c

TITLE: Structure of thujopsen and hinokiic acid

AUTHOR(S): Erdtman, H.; Norin, T.

CORPORATE SOURCE: Kgl. Tek. Hogskolan, Stockholm

SOURCE: Chemistry &amp; Industry (London, United Kingdom) (1960) 622-3

CODEN: CHINAG; ISSN: 0009-3068

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

ED Entered STN: 22 Apr 2001

GI For diagram(s), see printed CA Issue.

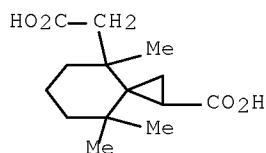
AB Thujopsen (I, R = H) (II) ozonized gave III, m. 168°, which was further oxidized to IV, m. 215°, which easily gave V, m. 114°, by a Dieckmann condensation. V with SeO<sub>2</sub> followed by H<sub>2</sub>O<sub>2</sub> gave VI, which on heating gave a stable 6-membered ring anhydride, m. 211°, possessing a rigid spirocyclic structure. IV with Ac<sub>2</sub>O gave a 7-membered ring anhydride, m. 113°. V with NaBH<sub>4</sub> gave the alc., m. 133°, which dehydrogenated with Se gave  $\alpha$ -methyl-naphthalene and a tetrahydronaphthalene derivative which with O<sub>3</sub>, then H<sub>2</sub>O<sub>2</sub>, gave  $\alpha,\alpha$ -dimethyladipic acid (VII). V with MeMgI gave VIII, m. 63°, which dehydrogenated with Se gave 1,6-dimethyl-naphthalene and a tetrahydronaphthalene derivative which was oxidized to VII as before. V contained a CO group conjugated with a cyclopropane ring, but the infrared spectrum of the anhydride of IV (but not of VI) indicated a -CH<sub>2</sub>- group adjacent to CO. Hydrogenation of II (MeOH-Et<sub>2</sub>O, Pd-C) gave IX (R = Me) (X). Further hydrogenation gave tetrahydrothujopsen. X with O<sub>3</sub> gave an oxocarboxylic acid, C<sub>15</sub>H<sub>26</sub>O<sub>3</sub>, m. 160-1°, further oxidized to a dicarboxylic acid, C<sub>14</sub>H<sub>24</sub>O<sub>4</sub> (XI), m. 188°, which by Dieckmann condensation readily gave XII, m. 202°. None of these 3 compds. showed ultraviolet absorption, indicating the presence of a cyclopropane ring conjugated with CO. Similarly, hinokiic acid (I, R = CO<sub>2</sub>H) (XIII) gave XI, m. 188°, via IX (R = CO<sub>2</sub>H) (XIV), m. 160°. II and XIII exhibit infrared absorption at 1380 cm.<sup>-1</sup>, which band strongly increased in the dihydro derivs.; this conformed with the appearance of a new Me group after hydrogenation. Proton magnetic resonance (PMR) studies on II, XIII and their derivs. confirmed the structure II; 3 protons were found at the cyclopropane ring in the anhydride of VI. The PMR spectra of X and XIV showed a prominent line corresponding to an addnl. angular Me group; olefinic H atoms gave rise to 1 sharp line indicating the presence of .tplbond.CCH:C:. V exhibited a strong pos. Cotton effect. Application of the octant rule to V thus suggested that the cyclopropane ring stands out from the plane of the paper.

IT ~~93865-03-3P~~, Spiro[2.5]octane-4-acetic acid,  
1-carboxy-4,8,8-trimethyl- ~~105912-69-4P~~,  
Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl-  
RL: PREP (Preparation)

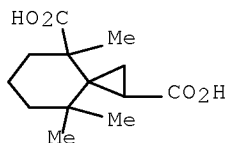
(preparation of)

RN 93865-03-3 HCAPLUS

CN Spiro[2.5]octane-4-acetic acid, 1-carboxy-4,8,8-trimethyl- (CA INDEX NAME)



RN 105912-69-4 HCAPLUS  
 CN Spiro[2.5]octane-1,4-dicarboxylic acid, 4,8,8-trimethyl- (CA INDEX NAME)



OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
 (1 CITINGS)

L25 ANSWER 34 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1932:33661 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 26:33661

ORIGINAL REFERENCE NO.: 26:3489b-i

TITLE: Chemistry of alkylcyclopentanones. II. Effect of the methylcyclopentane ring on the carbon tetrahedral angle

AUTHOR(S): Desai, Ranchhodji Dajibhai

SOURCE: Journal of the Chemical Society (1932)

1065-79

CODEN: JCSOA9; ISSN: 0368-1769

DOCUMENT TYPE: Journal

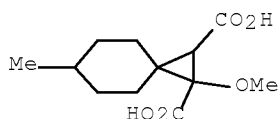
LANGUAGE: Unavailable

ED Entered STN: 16 Dec 2001

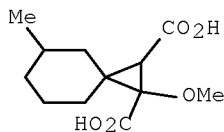
AB cf. C. A. 25, 4234. The results obtained, in the decomposition of the mono- and di-Br esters of 3-methylcyclopentane-1,1-diacetic acid show that the methylcyclopentane ring bears the closest similarity to the cyclopentane ring and differs fundamentally from the cyclohexane nucleus. If the effect of this ring were due to polar factors, it should be similar to the gem-EtPr group; the effect is, however, more in harmony with that of the gem-Me<sub>2</sub> group and is due to valency deflection. Et H 3-methylcyclopentane-1,1-diacetate yields the anhydride on distillation. The  $\alpha$ -Br derivative (I), b<sub>7</sub> 163°, results in 80% yield; 3 distns. give the lactonic ester, b<sub>20</sub> 188°; the mono-Br acid ester is a dark yellow viscous oil. Hydrolysis of I with KOH at 150° gives trans-3-methylcyclopentanespirocyclopropane-2',3'-dicarboxylic acid A, m. 230° (dianilide, m. 295°), and the acid B, m. 215° (dianilide, m. 275°); the Et<sub>2</sub>O solution from the above acids gives the cis-anhydride A, m. 75°, from which was prepared the cis-acid A, m. 175°; anilic acid, m. 190°. Heating I with Na<sub>2</sub>CO<sub>3</sub> for 72 hrs. gives the lactonic acid A (of- $\alpha$ -hydroxy-3-methylcyclopentane-1,1-diacetic acid), m. 87°; aniline salt, m. 95°. The acid ester, similarly treated for 12 hrs., gives the lactonic acid B, m. 75°. The  $\alpha,\alpha'$ -di-Br ester (II) is a reddish yellow viscous liquid; the Et H ester m. 128°. Distillation of II gives the lactone of Et H  $\alpha$ -bromo- $\alpha'$ -hydroxy-3-

methyl- cyclopentane-1,1-diacetate, b15 195-6°. The  $\alpha,\alpha'$ -dibromo-3-methylcyclopentane-1,1-diacetic acids m. 195° (decomposition) and 163°. Hydrolysis of II with KOH gives  $\alpha$ -keto-3-methylcyclopentane-1,1-diacetic acid, m. 121° (quinoxaline derivative, m. 226-7°; 2,4-dinitro-phenylhydrazine, S-yellow, m. 185° (decomposition); Me ester, b19 169°, whose phenylhydrazone m. 163°), and a small quantity of the trans-lactone of the di-HO acid, m. 146°. Oxidation of keto acid gives 1-carboxy-3-methylcyclopentane-1-acetic acid, m. 120°, which was also prepared from 3-methylcyclopentanone cyanohydrin, b25 128-30°. Methylcyclopentanone, BrCH<sub>2</sub>CO<sub>2</sub>Et and Zn give 25-30% of Et 3-methylcyclopentan-1-ol-1-acetate, b20 121°; free acid (III), m. 56; 20-5% of the ketone underwent self-condensation, giving 4-methyl-2-(3'-methylcyclopentylidene)cyclopentanone, b2, 132-3°, d<sub>420</sub> 0.9552, n<sub>D20</sub> 1.4964; semicarbazone, m. 142-3°. Heating III with AC<sub>2</sub>O 4 hrs. gives 3-methylcyclopentylideneacetic acid, m. 112°. Hydrolysis of II with MeOH-KOH gives trans-3-methylcyclopentanespiro-2'-methoxycyclopropane- 2',3'-dicarboxylic acid A, m. 190°, and B, m. 178°; the lactone of the  $\alpha$ -hydroxy- $\alpha'$ -methoxy acid m. 150°; the cis-methoxyspiro acid A m. 175°, and its anhydride m. 87°; the B acid m. 162° and its anhydride m. 60°. The  $\alpha$ -hydroxy- $\alpha'$ -methoxy acid m. 145°. Heating the Et H ester of the di-Br acid with Na<sub>2</sub>CO<sub>3</sub>, gives the trans-lactone, m. 146° (Ac derivative, m. 151°), and the cis-isomer, m. 125°, of  $\alpha,\alpha'$ -dihydroxy-3-methylcyclopentane-1,1- diacetic acid. Me 3-methylcyclopentane-1,1-diacetate, b15 137°, and (CO<sub>2</sub>Me)<sub>2</sub> with Na in Et<sub>2</sub>O give Me 3-methylcyclopentanespiro-3',4'- diketocyclopentane- 2',5'-dicarboxylate, m. 125°; FeCl<sub>3</sub> gives a red color; semi-carbazone, m. 182°; heating with 20% H<sub>2</sub>SO<sub>4</sub> gives 3-methylcyclopentanespirocyclopentane-3',4'-dione, m. 108° (disemicarbazone, m. 245° (decomposition)). The acid chloride of Et 1-carboxy-3-methylcyclopentane-1-acetate and MeZnI give the Et ester, b11 135°, d<sub>416</sub> 1.008, n<sub>D16</sub> 1.45723 (semicarbazone, m. 105°), of 1-acetyl-3-methylcyclopentane-1-acetic acid, m. 83° (semicarbazone, m. 200°). The ester with EtONa gives 20% of 3-methylcyclopentanespirocyclopentane-2',4'-dione, m. 101° (Br derivative, m. 185°).

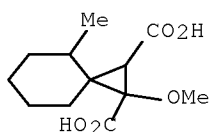
IT 871876-17-4, 3,6-Spirooctane-1,2-dicarboxylic acid,  
1-methoxy-6-methyl- 871876-18-5,  
3,6-Spirooctane-1,2-dicarboxylic acid, 1-methoxy-5-methyl-  
871876-19-6, 3,6-Spirooctane-1,2-dicarboxylic acid,  
1-methoxy-4-methyl-  
(isomers and derivs.)  
RN 871876-17-4 HCAPLUS  
CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-6-methyl- (CA INDEX  
NAME)



RN 871876-18-5 HCAPLUS  
CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-5-methyl- (CA INDEX  
NAME)



RN 871876-19-6 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-4-methyl- (CA INDEX NAME)



L25 ANSWER 35 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1932:33660 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 26:33660

ORIGINAL REFERENCE NO.: 26:3488a-i,3489a-b

TITLE: Formation and stability of spiro compounds. XIV.  
 Effect of the methylcyclohexane ring on the carbon tetrahedral angle

AUTHOR(S): Desai, Ranchhodji Dajibhai

SOURCE: Journal of the Chemical Society (1932)  
 1047-65

CODEN: JCSOA9; ISSN: 0368-1769

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

ED Entered STN: 16 Dec 2001

AB The recent work of Rao (C. A. 24, 4022) and Kandiah (C. A. 25, 3334) has shown that when cyclohexane is interlocked in the o-position with a 6- or 5-membered ring, the resulting dicyclic nuclei behave like strainless rings. The present study of the decomposition products of the mono-Br and di-Br esters of 3- and 4-methylcyclohexane-1,1-diacetic acids shows that the methylcyclohexane ring simulates the behavior of strainless rings such as cyclopentane and especially trans-decalin and hexahydrohydrindene; the question, "How is this strain relieved?" is discussed. The  $\omega$ -imide of 4-methylcyclohexane-1,1-dicyanoacetic acid on hydrolysis with hot dilute H<sub>2</sub>SO<sub>4</sub> gives 4-methylcyclohexane-1, 1-diacetic acid (I), but with cold concentrated H<sub>2</sub>SO<sub>4</sub> there results the  $\omega$ -imide of 4-methylcyclohexane-1,1-dicarbamylacetic acid, m. 260° (decomposition). The Et ester of I b24 178°. The anhydride of I and PhNH<sub>2</sub> give 2 anilic acids, separated by crystallization from EtOH, m. 184° and 148°; only 1 anil, m. 140°, was formed. The anhydride and EtONa-EtOH give the Et H ester of I, viscous oil, yielding the anhydride on distillation This ester with PCl<sub>6</sub> and Br at 50-60° gives 75% of Et- $\alpha$ -bromo-4-methylcyclohexane-1,1-diacetate (II), which loses EtBr on distillation, giving the lactonic ester, b20 205°. The mono-Br acid ester is a dark yellow, viscid oil. Hydrolysis of II with 64% KOH at 150° gives a mixture of the trans-4-methylcyclohexanespirocyclopropane-2',3'-dicarboxylic acid, m. 212°, and the cis-acid, m. 165°, separated by heating with AcCl for 12 hrs.; the anhydride

from the cis-acid m. 72°. A small quantity of a lactone acid, m. 145°, was isolated. The trans-spiro acids of this and the m-series are stable to 5% HCl at 240° and to 10% HCl at 200° but are decomposed by the latter at 240° and by 20% HCl at 200°. I, PC15 and Br, heated at 50-60° and poured into EtOH, give 85% of Et  $\alpha$ ,  $\alpha'$ -dibromo-4-methylcyclohexane-1,1-diacetate (III), which yields the bromolactonic ester, b21 235°, on distillation. The acid product of the dibromination was a semi-solid mixture of di-Br and mono-Br acid esters, separated by extraction with C6H6-petroleum. Warming the di-Br acid chloride with HCO2H for 4 hrs. gives the lactone

$\alpha$ -bromo- $\alpha'$ -hydroxy-4-methylcyclohexane-1,1-diacetic acid, m. 210°, and also the,  $\alpha$ , $\alpha'$ -di-Br derivative of I, m. 185° (decomposition). Hydrolysis of III with 64% KOH at 150° gives a small quantity of 4-methylcyclohexenylacetic acid, m. 42-3°;  $\alpha$ -keto-4-methylcyclohexane-1,1-diacetic acid A, m. 147° (insol. in C6H6); quinoxaline derivative, m. 226°; 2,4-dinitrophenylhydrazone, S-yellow, m. 220°; Me ester, b25 192° (phenylhydrazone, m. 163°); the C6H6, extract gave the keto acid B, m. 128-9°; quinoxaline derivative, m. 245°; 2,4-dinitrophenylhydrazone, S-yellow, m. 205° (decomposition phenylhydrazone, m. 204° (decomposition); Me ester, b20 187° phenylhydrazone, m. 227° (decomposition). Oxidation of A with alkaline H2O2 gives 1-carboxy-4-methylcyclohexane-1-acetic acid A, m. 136° the B isomer m. 173° (decomposition) and yields an anhydride, m. 104°, and an anilic acid, m. 184°. Hydrolysis of III with MeOH-KOH by heating 20 min., refluxing the acids with AcCl and extracting the Et2O solution with 5% NaHCO3 gives the anhydride A, m. 148°, of IV and from the petroleum extract, anhydride B, m. 90°. The anhydride A gives the anilic acids A and B, m. 183° and 160°, and give the same anil, m. 134°. Anilic acids A' and B', m. 193° (decomposition) and 157°, precipitated at once when the anhydride B and PhNH2 were mixed in C6H6; the anil m. 96°. Anhydride A gives cis-4-methylcyclohexanespiro-2'-methoxycyclopropane-2',3'-dicarboxylic acid A (IV), m. 182° (decomposition); the cis-acid B m. 162° (decomposition). The NaHCO3 extract gives the trans-acid A, m. 190°, which gives the cis-anhydride A on distillation IV and HBr, refluxed 6 hrs., give 1-carboxy-4-methylcyclohexane-1-acetic acid, m. 173°, and  $\alpha$ -keto-4-methylcyclohexane-1,1-diacetic acid B, m. 129°; the cis-acid B gave the keto-acid A, m. 147°. The  $\omega$ -imide of 3-methylcyclohexane-1,1-dicarbamylacetic acid m. 272° (decomposition). Et 3-methylcyclohexane-1,1-diacetate (V) b22 174°; the anilic acids A and B m. 172° and 141°; the anil m. 137°. Et  $\alpha$ -bromo-3-methylcyclohexane-1,1-diacetate (VI) results in 75% yields and on distillation gives the lactonic ester, b16 196°; the mono-Br acid ester is a dark yellow viscous liquid. Hydrolysis of VI with 64% KOH at 150° gives trans-3-methylcyclohexanespirocyclopropane-2',3'-dicarboxylic acid A, m. 270° (dianilide, m. 280°); the more soluble transacid B m. 245° (dianilide, m. 260°); the cis-acid A m. 205°. The  $\alpha$ , $\alpha'$ -di-Br derivative of V results in 85% yield and on distillation gives the Br lactonic ester, pale yellow, b21 234°, m. 130°; the Et H ester m. 162°. The gum obtained by decomposing the di-Br acid chloride with HCO2H gives a mixture of the Br lactonic acid A, m. 225°, and B, m. 201°. Hydrolysis of the di-Br ester with KOH at 150° gives 3-methylcyclohexenylacetic acid, b20 152-3 °  $\alpha$ -keto-3-methylcyclohexane-1,1-diacetic acid A m. 139-40° (quinoxaline derivative, m. 217°; 2,4-dinitrophenylhydrazone, yellow, m. 198°); the more soluble (in C6H6) keto acid B m. 126-7° (quinoxaline derivative, m. 239°; 2,4-dinitrophenylhydrazone, S-yellow, m. 194° (decomposition); the Me ester, b23 185°, gives a phenylhydrazone, m. 220° (decomposition)). Oxidation of the acid B with H2O2 gives 1-carboxy-3-methylcyclohexane-1-acetic acid, m. 163° (decomposition); the anhydride b22 166°, m. 41°; anilic acid, m. 170° (decomposition); anil, m. 139°. Hydrolysis with MeOH-KOH gives cis-3-methylcyclohexanespiro-2'-methoxycyclopropane-2',3'-dicarboxylic anhydride A, m. 140-1°; the anhydride B m. 116°, anhydride C m. 101° and anhydride D m. 85°; anilic acid A, m. 195° (decomposition), and B, m. 135°, and anil, m. 112°, were prepared from anhydride A; the cis-MeO acid A m. 194° (decomposition). The cis-anhydride B

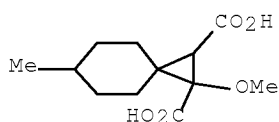
Serial No.:10/691,095

gives an anilic acid, m. 215° (decomposition); the cis-MeO acid B m. 195° (decomposition). Anhydride C gives an anilic acid, m. 212°; the cis-MeO acid C m. 197° (decomposition). Anhydride D gives an anilic acid, m. 192° (decomposition), and an anil, m. 118°; the cis-MeO acid D m. 196° (decomposition). trans-3-Methylcyclohexanespiro-2'-methoxycyclopropane-2',3'-dicarboxylic acid A m. 201°; distillation gives the cis-anhydride A.

IT ~~871876-17-4~~, 3,6-Spirooctane-1,2-dicarboxylic acid,  
1-methoxy-6-methyl- ~~871876-18-5~~,  
3,6-Spirooctane-1,2-dicarboxylic acid, 1-methoxy-5-methyl-  
~~871876-19-6~~, 3,6-Spirooctane-1,2-dicarboxylic acid,  
1-methoxy-4-methyl-  
(isomers and derivs.)

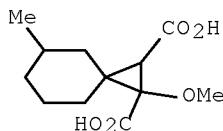
RN 871876-17-4 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-6-methyl- (CA INDEX NAME)



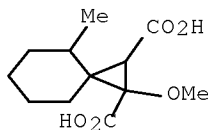
RN 871876-18-5 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-5-methyl- (CA INDEX NAME)



RN 871876-19-6 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-methoxy-4-methyl- (CA INDEX NAME)



L25 ANSWER 36 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1924:2605 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 18:2605

ORIGINAL REFERENCE NO.: 18:379b-i,380a-b

TITLE: Ring-chain tautomerism. VIII. The effect of the

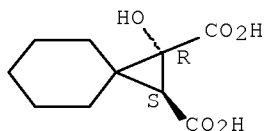
AUTHOR(S): cyclohexane nucleus on the carbon tetrahedral angle  
 Lanfear, E. W.; Thorpe, J. F.  
 SOURCE: Journal of the Chemical Society, Transactions ( 1923), 123, 2865-70  
 CODEN: JCHTA3; ISSN: 0368-1645  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 ED Entered STN: 16 Dec 2001

AB Hydrolysis of Et  $\alpha,\alpha'$ -dibromocyclohexane-1,1-diacetate (C. A. 9, 3059) gave a mixture of the trans- and cis-cyclohexanespiro-1-hydroxycyclopropane-1,2-dicarboxylic acids (I and II), the former of which m. 217° and was identical with that previously obtained from the bromolactone, while the latter m. 163°. Ag<sub>2</sub> salts. Warming II with AcCl gave the anhydride, m. 102°, reconverted into II by dilute alkali. Concentrated HBr, with either I or II gave  $\alpha$ -ketocyclohexane-1,1-diacetic acid, m. 130°. In the case of I, the bromolactonic acid, m. 161°, was also formed. The keto acid is completely converted into the K salt of I by boiling 0.5 hr. with concentrated aqueous KOH. These facts complete the chain of proofs advanced for the hypothesis regarding the C tetrahedral angle.

IT 1194718-54-1P 1194759-71-1P  
 RL: SPN (Synthetic preparation); PRP (Properties); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (Ring-chain tautomerism. VIII. The effect of the cyclohexane nucleus on the carbon tetrahedral angle)

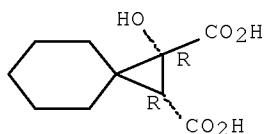
RN 1194718-54-1 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-hydroxy-, (1R,2S)-rel- (CA INDEX NAME)

Relative stereochemistry.



RN 1194759-71-1 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-hydroxy-, (1R,2R)-rel- (CA INDEX NAME)

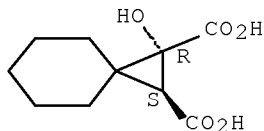
Relative stereochemistry.



IT 904818-53-7P, 3,6-Spirooctane-1,2-dicarboxylic acid, 1-hydroxy-,  
 cis- 904833-38-1P, 3,6-Spirooctane-1,2-dicarboxylic acid,  
 1-hydroxy-, trans-  
 RL: PREP (Preparation)  
 (preparation of)

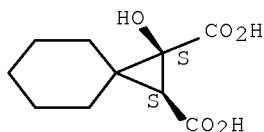
RN 904818-53-7 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-hydroxy-, (1R,2S)- (CA INDEX NAME)

Absolute stereochemistry.



RN 904833-38-1 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1-hydroxy-, (1S,2S)- (CA INDEX NAME)

Absolute stereochemistry.



L25 ANSWER 37 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 1921:20457 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 15:20457

ORIGINAL REFERENCE NO.: 15:3825b-i,3826a

TITLE: Formation and stability of spiro compounds. VI. New derivatives of cyclopropane and cyclohexanespirocyclopropane

AUTHOR(S): Birch, Stanley Francis; Henry, William; Kon, George Armand Robert

CORPORATE SOURCE: Imp. Inst. Sci. Tech., South Kensington

SOURCE: Journal of the Chemical Society, Transactions (1921), 119, 1315-28

CODEN: JCHTA3; ISSN: 0368-1645

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

ED Entered STN: 16 Dec 2001

GI For diagram(s), see printed CA Issue.

AB In searching for possible new sources of cyclopropane derivs. it has been found that the bridged piperidine compds. of Guareschi (C. A. 6, 865) on regulated hydrolysis with alkali furnish such a source. 2,3-Dicyano-1,1-dimethylcyclopropane-2-carboxamide (H), is obtained by boiling with 10% KOH (1 mol.) for 5 min. and then cooling, long flattened needles from dilute alc. or C6H6, m. 163.5°. The acid, C8H8O2N2 (U), is obtained when 5 g. H in 100 cc. cold concentrated H2SO4 are treated with saturated NaNO2 in H2O until the mixture is nearly solid. The product is poured into H2O, extracted with Et2O and the acid removed with Na2CO3. It forms large transparent rhombic laminae, m. 168-9°, from H2O. The acid may also be obtained by boiling the imide with 5% KOH for 1 hr. The mother-liquors from j contained terebic acid and a



compound,  $\text{HOCMe}_2\text{CH}(\text{CN})\text{CH}(\text{CN})\text{CO}_2\text{H}$  (?), forming fine, long needles from  $\text{H}_2\text{O}$  and m. 234-5°. J, heated with a little water in a sealed tube for 1 hr. at 180-200°, gave, 1,1-dimethylcyclopropane-2,3-dinitrile,  $\text{C}_7\text{H}_8\text{N}_2$ , b<sub>12</sub> 158°, long, flattened needles, m. 50°. Boiled with alc. KOH, a mixture of cis- and trans-caronic acids was obtained (Beesley, Ingold, and Thorpe, CA. 9,3059). When 3.8g. H are heated with 6g. KOH in 45 cc.  $\text{H}_2\text{O}$  for 3-4 hrs.,  $\beta$ -hydroxy- $\beta$ -methylbutane- $\alpha,\delta,\delta$ -tricarboxylic lactone (K),  $\text{C}_8\text{H}_{10}\text{O}_6$ , is formed, large prisms from a small amount  $\text{H}_2\text{O}$  (in which it is very soluble), m. 157°. Silver salt, very soluble in  $\text{H}_2\text{O}$ . Warmed with 25%  $\text{H}_2\text{SO}_4$ , the lactone loses 1  $\text{CO}_2$  and gives terebic acid (J. Chemical Society 75, 48).  $\alpha,\beta$ -Dicyano- $\alpha$ -hydroxy- $\alpha$ -methylbutane- $\alpha,\beta$ -dicarboxylic acid (L),  $\text{Me}_2\text{C}(\text{OH})\text{C}(\text{CN})(\text{CO}_2\text{H})\text{CH}(\text{CN})\text{CO}_2\text{H}$ , prepared by heating the imide with 3 mols. aqueous KOH for 0.5 hr. and then acidifying, thick, transparent rhombic plates from  $\text{H}_2\text{O}$ , m. 195-6° (decomposition). With 50%  $\text{H}_2\text{SO}_4$  the acid is decomposed into  $(\text{HO}_2\text{CCH}_2)_2$  and AcMe. The action of concentrated KOH on the imide gave K. Cyclohexanespiro-2,3-dicyanocyclopropane-2-carboxamide,  $\text{C}_{11}\text{H}_{12}\text{ON}_3$ , from the spiro-imide as above, fine, glistening plates or felted needles from dilute alc or  $\text{C}_6\text{H}_6$  141°. The acid,  $\text{C}_{11}\text{H}_{12}\text{O}_2\text{N}_2$ , prepared by the action of  $\text{NaNO}_2$  on the amide or by direct hydrolysis of the spiro-imide with 2 mols. KOH, forms prisms, m. 159°, best from 50% HCl. Cyclohexanespiro-2,3-dinitrile,  $\text{C}_{10}\text{H}_{12}\text{N}_2$ , lustrous plates, m. 86°, which, on hydrolysis, gave cyclohexanespiro-2,3-dicarboxylic acid (B., I. and T.) 1-Hydroxycyclohexylethane- $\alpha,\beta,\beta$ -tricarboxylic  $\alpha$ -lactone,  $\text{C}_{11}\text{H}_{14}\text{O}_6$  (M), by heating the amide with 15% KOH for 4 hrs., spherical aggregates of buff-colored crystals, m. (not sharply) 183-4°, which is probably the trans-isomer since it is not affected by boiling  $\text{AcCl}$ . Silver salt. On heating above the m. p., or on boiling with 20%  $\text{H}_2\text{SO}_4$ , the  $\alpha$ -lactone of the  $\alpha,\beta$ -dicarboxylic acid (N) is formed, plates from  $\text{H}_2\text{O}$ , m. 184-5° Silver salts, both of the lactonic acid and the dibasic HO acid, were prepared N is stable to  $\text{KMnO}_4$ . Anilide,  $\text{C}_{15}\text{H}_{19}\text{ON}$ , iridescent plates, m. 113°. In its formation 1  $\text{H}_2\text{O}$  and 1  $\text{CO}_2$  appear to be eliminated. Cyclohexanespiro-2,3-dicyanocyclopropane-2,3-dicarboxylic acid,  $\text{C}_{12}\text{H}_{12}\text{O}_4\text{N}_2$ , by boiling a solution of the spiro-imide in 3 mols. 10% KOH for 30-40 min., small plates from dilute alc., m. and decompose 207°. Anhydride, by heating above the m. p. of the acid for 20 min., colored crystals, m. 99°. When an excess of KOH is used in the hydrolysis, cyclohexanespiro-2-cyanocyclopropane-2,3,3-tricarboxylic acid,  $\text{C}_{12}\text{H}_{13}\text{O}_6\text{N}$ , results, stellate clusters of prisms, m. 169° (decomposition). The potassium hydrogen salt forms needles from alc., m. 237° (decomposition).

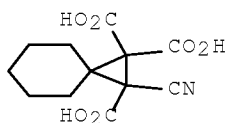
IT 861368-12-9P, 3,6-Spirooctane-1,1,2-tricarboxylic acid, 2-cyano-  
 861515-57-3P, 3,6-Spirooctane-1-carboxamide, 1,2-dicyano-  
 861564-55-8P, 3,6-Spirooctane-1,2-dicarboxylic acid, 1,2-dicyano-  
 861564-58-1P, 3,6-Spirooctane-1-carboxylic acid, 1,2-dicyano-

RL: PREP (Preparation)

(preparation of)

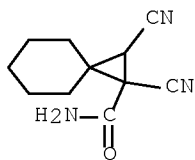
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CN Spiro[2.5]octane-1,1,2-tricarboxylic acid, 2-cyano- (CA INDEX NAME)

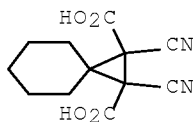


RN 861515-57-3 HCAPLUS

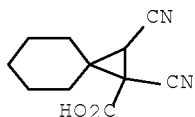
CN Spiro[2.5]octane-1-carboxamide, 1,2-dicyano- (CA INDEX NAME)



RN 861564-55-8 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxylic acid, 1,2-dicyano- (CA INDEX NAME)



RN 861564-58-1 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 1,2-dicyano- (CA INDEX NAME)



L25 ANSWER 38 OF 38 HCAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 1915:18519 HCAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 9:18519  
 ORIGINAL REFERENCE NO.: 9:3059h-i,3060a-i,3061a-h  
 TITLE: Formation and stability of spiro-compounds. I.  
 Spiro-compounds from cyclohexano  
 AUTHOR(S): Beesley, Richard M.; Ingold, Christopher K.; Thorpe, Jocelyn F.  
 SOURCE: Journal of the Chemical Society, Transactions ( 1915), 107, 1080-1106  
 CODEN: JCHTA3; ISSN: 0368-1645  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 ED Entered STN: 16 Dec 2001  
 GI For diagram(s), see printed CA Issue.  
 AB A series of investigations has been undertaken with the object of ascertaining "the effect produced by the alteration of the tetrahedral angle consequent on ring formation, on the formation and stability of a 2nd ring joined to the existing ring by a quaternary C atom common to both." The hypothesis was advanced that the angle formed by the 2 side chains attached to any 1 C atom of the cyclohexane ring will be altered in proportion to any change in angle between those valencies which participate in ring formation; i. e., the groups attached to 2 side chains emanating from the same C atom of a cyclohexane

derivative, type (I), will be closer together than in a corresponding compound having the open chain structure, type (II). Expts. show that this hypothesis is probably correct. For example a trans-spiro-acid, derived from a compound of type (I) is more stable than trans-caronic acid, derived from a compound of type (II). The above hypothesis and another untenable one are presented and discussed in some detail and diagrammatically represented by showing the effect of "strain" on the angles between the valencies (represented by the apices of an inscribed tetrahedron) of a (spherical) C atom. The bromination of  $\text{CH}_2(\text{CH}_2)_4\text{C}(\text{CH}_2\text{CO}_2\text{H})_2$  by means of  $\text{PBr}_5$  and Br led to the formation of a mixture containing an acid product, probably  $\text{C}_5\text{H}_{10}\text{C}(\text{CHBrCO}_2\text{H})(\text{CH}_2\text{CO}_2\text{Et})$  (A), and a neutral product (B). The latter was shown to be a mixture of cis-diethyl  $\alpha, \alpha'$ -dibromocyclohexane-1,1-diacetate (C) (not obtained in the pure state) and the trans-lactone (D),  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}(\text{CO}_2\text{Et}).\text{O}.\text{CO}.\text{CHBr}$ , prisms from petroleum or alc., m.  $96^\circ$ , b<sub>20</sub>  $225-30^\circ$ . (D) was separated from the mixture (B) by the addition of an equal volume of petroleum (b.  $60-70^\circ$ ) and was also synthesized by boiling (C) with  $\text{C}_5\text{H}_5\text{N}$  [whereby only the trans-form of (C) was converted into (D)] or by distilling (C), whereby both the cis- and trans-forms were converted. The isomeric cis-lactone (D'), microneedles, m.  $69-70^\circ$ , was formed in 25% yield upon distilling (C) from which (D) had been previously removed by means of  $\text{C}_5\text{H}_5\text{N}$ .  $\alpha$ -Hydroxycyclohexane-1,1-diacetic acid lactone (E),  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}(\text{CO}_2\text{H}).\text{O}.\text{CO}.\text{CH}_2$ , b<sub>13</sub>  $240-1^\circ$ , crystallizing after long standing and seeding, microneedles, m.  $91-2^\circ$  (silver salt, amorphous), was formed from (A) by the action of boiling  $\text{Na}_2\text{CO}_3$ . The free acid (F) corresponding to (E) could not be isolated and was found to be stable only in the form of its salts. The amorphous silver salt and crystalline sodium salt of (F) were prepared. The dianilide of (F),  $\text{C}_5\text{H}_{10}\text{C}(\text{CH}_2\text{CONHPh})\text{CH}(\text{OH})\text{CONHPh}$ , needles, m.  $97^\circ$ . The aniline salt of (E), silky needles, m.  $104^\circ$ . When (A) was added to boiling concentrated KOH and the reaction mixture cooled and acidified, trans-cyclohexane-spiro-cyclopropane-1,2-dicarboxylic acid (G),  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}(\text{CO}_2\text{H}).\text{CHCO}_2\text{H}$ , flattened needles, m.  $237^\circ$ , was formed. Its silver salt separated in the form of a crystalline powder: its dianilide, needles, m.  $292^\circ$ . The filtrate from (G) after extraction with  $\text{Et}_2\text{O}$  and fractionation under reduced pressure yielded the cis-isomer (H) of (G), needles, m.  $198^\circ$ , more readily formed by distilling (G) which is first converted into the anhydride (J),  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}.\text{CO}.\text{O}.\text{CO}.\text{CH}$ , needles, m.  $102^\circ$ , which on treatment with alkali and subsequent acidification yields (H). (J) was also readily prepared by the interaction of (H) and  $\text{AcCl}$ , whereas (G) is not acted upon by this reagent. The anilic acid,  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}(\text{CO}_2\text{H}).\text{CHCONHPh}$ , derived from (J), small needles, m.  $207^\circ$  (decomposition); the corresponding anil, m.  $119^\circ$ . When heated in a sealed tube with 50% concentrated HCl at  $180^\circ$  for 5 hrs., (H) is partially reconverted into (G). On attempting to replace the Br in (D) by an OH group, by means of moist  $\text{Ag}_2\text{O}$ , ethyl  $\alpha$ -hydroxycyclohexane-1,1-diacetate lactone,  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}_2\text{CO}.\text{O}.\text{CHCO}_2\text{Et}$ , b<sub>21</sub>  $210^\circ$ , was obtained and yielded (E) on hydrolysis. The following hydrolysis products were formed when (D) was treated with boiling 15% aqueous NaOH:  $\text{C}_5\text{H}_{10}\text{C}:\text{CHCO}_2\text{H}$  (K), m.  $92^\circ$  (identical with Wallach's acid as shown by the formation of the dibromide, m.  $135-6^\circ$ ; reference not given), and the trans-lactonic acid of  $\alpha, \alpha'$ -dihydroxycyclohexane-1,1-diacetic acid (L),  $\text{C}_5\text{H}_{10}\text{C}.\text{CH}(\text{OH}).\text{CO}.\text{O}.\text{CHCO}_2\text{H}.\text{H}_2\text{O}$ , prisms,  $100^\circ$ , anhydrous, m.  $145^\circ$ . (D') when subjected to a similar hydrolysis gave rise to a mixture of (K), the cis-isomer (M) of (L), prisms, m.  $168^\circ$ , and cyclohexane-spiro-cyclopropanol-2,3-dicarboxylic acid (N),  $\text{C}_5\text{H}_{10}\text{C}.\text{C}(\text{OH})(\text{CO}_2\text{H}).\text{CHCO}_2\text{H}$ , pearly plates, m.  $217^\circ$ . Boiling alc. KOH, reacting with (D), yielded (K), (L) and (N). The action of 64% aqueous KOH on (D) gave rise to a mixture of (L), (N) and  $\Delta^1$ -cyclohexeneacetic acid, (O),  $\text{CH}_2(\text{CH}_2)_3\text{CH}:\text{C}.\text{CH}_2\text{CO}_2\text{H}$ , m.  $38^\circ$  (identical with Wallach's compound; also quant. formed by boiling (K) with 64% KOH, thus indicating that it was a byproduct in the above reaction). The Et ester of (O), b<sub>25</sub>  $118-2^\circ$  (cf. Auwers and Ellinger, C. A. 6, 1147). A similar reaction between 64% KOH and (D') gave rise to (O), (M) and (N). (K) and (N) were separated by treatment with dry

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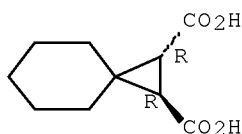
Et2O in which (N) is insol. (L) was ordinarily separated from hydrolysis mixts. by esterifying and fractionating the ethyl ester, b25 206-10°. The following derivs. of (L) are described: disodium salt, crystalline; disilver salt, powder; aniline salt, microcrystals, m. 133-4°; dianilide, C5H10>C[CH(OH)CONHPh]2, short needles, m. 169°. (L) does not react with AcCl, is not reduced by AgOH, and when heated with H2O in a sealed tube or when distilled, passes into (M). The isolation of (M) was effected by esterifying hydrolysis mixts. and collecting the fraction of highest b. p., which was subsequently hydrolyzed with HCl. (M) was readily acetylated. The following derivs. of (M) were prepared: disilver salt; dianilide, needles, m. 169° (not identical with the dianilide derived from (L)); acetate, C5H10>CH(OAc).CO.O.CHCO2H, m. 156° (silver salt of the acetate, crystalline powder). The spiro-acid (N), which like (L) could not be acetylated, which is not converted into the lactone on heating and is otherwise stable, gave rise to the following compds.: silver salt, crystalline powder; anilide, needles, m. 202°. Concentrated H2SO4 acting upon (L) at 95-100°, gave rise to small amts. of cyclohexane-spiro-cyclopentanone, oil (forming a semicarbazone, needles, m. 175°), and an unidentified compound, m. 105°. When heated with an equal amount of H2O in a sealed tube at 240° for 0.5 hr., (L) yielded the lactonic acid of  $\alpha$ -hydroxy- $\alpha'$ -cyclohexan-1-olsuccinic acid, C5H10>C.O.CO.CH(OH).CHCO2H, cubical prisms, m. 131°, whose disodium salt, disilver salt and aniline salt, m. 123°, were prepared

IT 67911-20-0, 3,6-Spirooctane-1,2-dicarboxylic acid, trans-  
68194-50-3, 3,6-Spirooctane-1,2-dicarboxylic acid, cis-  
860756-70-3, 3,6-Spirooctane-1,2-dicarboxylic acid, 1-hydroxy-  
(and derivs.)

RN 67911-20-0 HCAPLUS

CN Spiro[2.5]octane-1,2-dicarboxylic acid, trans- (9CI) (CA INDEX NAME)

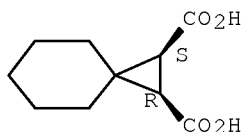
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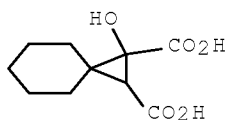
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Relative stereochemistry.

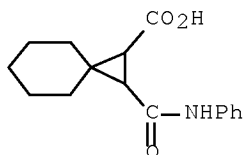


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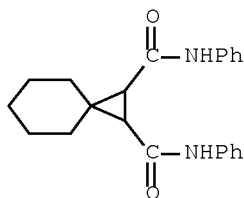
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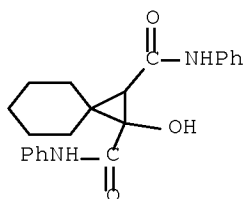
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 3,6-Spirooctane-1,2-diacetanilide, 1-hydroxy-  
 RL: PREP (Preparation)  
 (preparation of)  
 RN 859961-01-6 HCAPLUS  
 CN Spiro[2.5]octane-1-carboxylic acid, 2-[(phenylamino)carbonyl]- (CA INDEX  
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RN 860756-74-7 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxamide, N1,N2-diphenyl- (CA INDEX NAME)



RN 860756-76-9 HCAPLUS  
 CN Spiro[2.5]octane-1,2-dicarboxamide, 1-hydroxy-N1,N2-diphenyl- (CA INDEX  
 NAME)



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OS.CITING REF COUNT: 173 THERE ARE 173 CAPLUS RECORDS THAT CITE THIS  
RECORD (173 CITINGS)

# Search History

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            D SCAN
            SEL RN

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Serial No.:10/691,095

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LD,NT/CT OR MIGRAINE+OLD,NT/CT OR EPILEPSY+OLD,NT/CT  
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